NETWORK WORLD
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Feds blend EDI, EFT to pay the bills

By Paul Desmond
Senior Writer

CLEVELAND — The U.S. Department of Defense has begun paying its bills electronically using a fledgling standard that allows the agency to deliver detailed remittance information along with its funds.

Defense Department support is expected to provide a major boost to acceptance of the Corporate Trade Exchange (CTX) format, a National Automated Clearinghouse Association (NACHA) standard that blends ANSI's X12 electronic data interchange standards with NACHA's electronic funds transfer format.

CTX lets a user attach the electronic equivalent of nearly 5,000 paper remittance forms to a funds transfer. It also lets users customize the data sent with payments — by including items such as contract numbers — simplifying the payment process and saving time and money for both the user and its suppliers.

Defense Department backing promises to spur widespread support for CTX. Defense suppliers will now have an economic incentive to accept electronic payments and could begin to pressure their banks to support the format. Currently, only a handful

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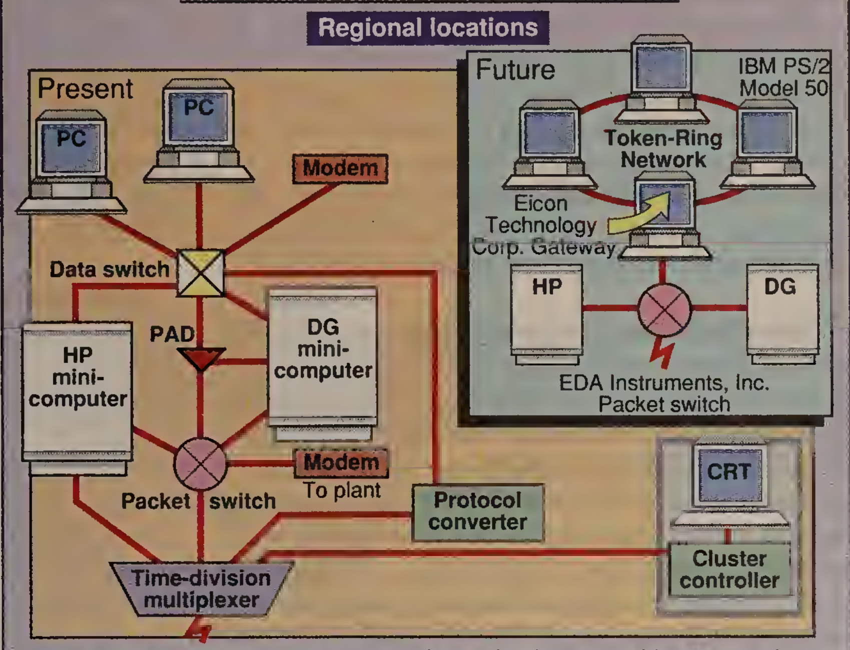
The evolution of LindeNet



Union Carbide Industrial Gases' X.25-based backbone enables personal computer users at regional and plant sites to access Hewlett-Packard Co., IBM and Data General Corp. hosts. Future enhancements will further streamline the network, increase functionality and cut costs.

GRAPHIC BY SUSAN J. CHAMPENEY SOURCE: UNION CARBIDE INDUSTRIAL GASES, INC., DANBURY, CONN.

Union Carbide subsidiary builds X.25 network utility

LindeNet integrates six host-dependent nets, provides universal CPU access, slashes costs.

By Paul Desmond
Senior Writer

DANBURY, Conn. — Union Carbide Industrial Gases, Inc. has consolidated six networks into an X.25 packet-switched backbone that supports a variety of computing environments but is independent of any one proprietary architecture.

The network has saved the company — known until recently as the Linde Division of Union Carbide Corp. — $400,000 per year in line costs and has made it possible to centralize network management. It also enabled the firm to replace vendor-specific terminals with personal computers that give users access to four distinct computing environments.

With that foundation in place, Industrial Gases is now forging ahead with plans to enhance its

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AT&T cuts rates on digital private lines

Changes price and discount structures, offers savings up to 34% on T-1, 42% on T-3 circuits.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — AT&T last week continued its aggressive pursuit of corporate customers by chopping rates and restructuring volume discount plans for its digital private-line services.

The tariff changes, scheduled to take effect Aug. 24, will revamp the pricing schedule and provide big discounts for users of T-1 and T-3 services. They will also add new options and savings for customers committing to long-term service plans and increase the discounts available under AT&T's Multiservice Volume Pricing Plan to as much as 50%.

Based on circuit length, the discounts could save T-1 users as much as 34% off current monthly rates and T-3 users up to 42%.

AT&T is proposing cuts for the private-line category that go below the price floors established under the Federal Communications Commission's price cap plan. Price cap regulation, which took effect July 1, mandates that price increases and decreases should be no more than 5% for any one service category.

The price cap rules allow AT&T to reduce prices below the 5% floor, but the carrier has to offer additional cost support information and give the FCC 45 days to review prices before they take effect. For price changes that don't exceed the 5% limit, AT&T

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INSIDE

Trading nets are at the heart of brokerage firms, page 32.

Nets unhurt by slowdown in economy

By Barton Crockett and Wayne Eckerson
Network World Staff

While many signs point to a slowdown of the U.S. economy, users in most industries say they don't plan to cut network spending or curtail major net projects.

Several economists agree that the economic expansion that has graced the U.S. since 1982 is cooling. Sales are beginning to sag, while production costs and wages rise, squeezing profit margins.

Despite the economic slowdown, most communications managers interviewed by *Network World* said they don't anticipate major changes in their network budgets or project plans for the coming fiscal year. The exceptions are users in the retail, automotive and financial services industries, which may be harder

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NETLINE

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GOSIP NOW SUPPORTS ISDN as a means to transmit data across OSI nets. Page 2.

CUSTOMS DEPT. PLANS EDI link up with Norwegian counterpart. Page 2.

PESKY BUGS IN STATION equipment plague acceptance of ISDN offerings. Page 6.

SENATE SPURNS FTS 2000 again, this time with an RFP for a nationwide X.25 net. Page 6.

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NEWSPAPER

FEATURE

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Savvy users can fight threat of viral infection

Antiviral products prevent devastation of files.

By John Hunter
Contributing Editor

A few weeks ago, Joe bought a new utility program from a computer store and installed it on his home computer. He liked it so much that he took the disk to work for his buddies to copy. A few weeks later, the file allocation tables of every personal computer exposed to Joe's gift were destroyed — victims of a virus planted in Joe's off-the-shelf software.

While that account is fictional, the threat of viruses isn't. Networks make it easy for viruses to spread, but users can prevent viruses from wreaking havoc on their systems. Several types of software have been developed as preventive measures (see chart, page 42). But

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New GOSIP version debuts with built-in ISDN support

Virtual terminal, office document architecture standards also integrated into GOSIP Version 2.

By Gail Runnoe
Washington Correspondent

GAITHERSBURG, Md. — The National Institute of Standards and Technology (NIST) last week released Version 2 of its Government Open Systems Interconnection Profile (GOSIP), which adds support for Integrated Services Digital Network and other new functions.

GOSIP Version 2 will enable users of GOSIP-compliant networks to take advantage of high-speed ISDN public data transmission options and specifies adoption of the virtual terminal services and office document architecture (ODA) standards.

Virtual terminal services will enable terminals and hosts on different networks to communicate, regardless of the proprietary protocols used by each. ODA will allow for interexchange of compound documents containing text, voice and graphics.

GOSIP is a network architecture specification developed by the government and based on the OSI standard. After Aug. 15, 1990, all government network procurements must adhere to the GOSIP specification.

Version 1 of GOSIP — released Feb 15, 1989 — only included X.25 packet switching for wide-area links as well as Ethernet (IEEE 802.3), token-bus (IEEE 802.4) and token-ring (IEEE 802.5) for local networks.

Adding ISDN as a wide-area transport option will enable users to transmit data at 64K bit/sec, whereas X.25 typically supports data transfer rates of only 9.6K bit/sec, according to Walt Roehr, president of Telecommunications Networks Consulting, based in Reston, Va.

OSI applications supported by Version 1 included the X.400 electronic mail standard and File Transfer, Access and Management (FTAM).

Bowing to user demand

NIST modified GOSIP to include the new capabilities because of user input. Users pushed for ISDN support because it will likely become the preferred method of transferring digital data in the future, said James Burrows, director of the National Computer Systems Lab at NIST.

GOSIP Version 2 was published in the Federal Register last week, and NIST officials will accept public comments on the standard until Oct. 11.

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U.S. Customs set to build joint EDI net with Norway

Shared net will help cut down on shipping fraud.

By Barton Crockett
Senior Editor

WASHINGTON, D.C. — The U.S. Customs Service has announced plans to forge its first electronic data interchange link with a foreign customs agency.

The EDI link will be established with the Norwegian Directorate of Customs and Excise. It will support exchange of customs declarations and other information using the emerging EDI For Administration, Commerce and Transport (EDIFACT) standards.

The Customs Service is hoping the EDI network will help crack down on shipping fraud, according to Dale Snell, EDI working group chairman at the agency. The U.S./Norway EDI effort also represents an important extension of the U.S. Customs Service's efforts to shift its massive paper-based operations to EDI.

"Last year, we collected about 8.9 million [import declarations], each on average about 16 to 20 pages long," Snell said. "Replacing all of these with EDIFACT [documents] is a top priority for this agency."

Eventually, EDI transmissions using EDIFACT may replace nearly all the paperwork that now accompanies imports and exports filed with the Customs Service, Snell said.

Customs first began testing EDIFACT last fall when it kicked off a trial with three multinational companies ("Global EDI standard put to the test," *NW,* Aug. 8, 1988). No date has been set for the link with the Norwegian customs agency.

EDIFACT, which was formally embraced by the United Nations in 1987, is predicted by many observers to become the world's most widely used standard for international EDI ("Users around world divided on EDIFACT," *NW,* June 19).

According to Snell, an EDIFACT link between the U.S. and Norway will help the countries better enforce international export and import regulations.

Currently, little if any information on the shipment of goods flows between the agencies because they are already drowning

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Briefs

Shocking call. Doctors recently saved a 54-year-old woman from a near-fatal heart attack by administering an electric shock over a dial-up telephone line. The woman, who was at home at the time of the attack, had access to a briefcase-sized MDphone, a transtelephonic defibrillator made by MEDphone Corp. of Paramus, N.J.

The victim's husband opened the unit, which is plugged into a phone jack, automatically triggering a call to doctors at Jewish Hospital in St. Louis. He applied electronic pads to his wife's chest and stood by for instructions. After determining cardiac arrest, doctors downloaded a command to the unit, which delivered an electric charge to revive the patient. The device, which transmits a patient's vital signs over the line to the hospital, also has a speaker that doctors can use to communicate instructions.

Weather, backhoe disrupt service. Severe weather swept through upstate New York, New Jersey and Connecticut early last week, disrupting telephone service for more than 9,000 customers. In addition, MCI Communications Corp. customers in Boston experienced delays when a fiber backbone was cut in North Royalton, Ohio, forcing the carrier to reroute traffic up the East Coast. The increased traffic resulted in delays of varying lengths, according to an MCI spokesman. The fiber line, which was cut by a backhoe being used in the renovation of a service station, has been repaired.

EFT or bust. The National Automated Clearinghouse Association (NACHA) recently adopted a resolution calling for all money transfers made through the nation's automated clearinghouse system to be made electronically by July 1, 1991. NACHA is an association representing 42 regional electronic funds transfer associations.

AT&T to add ISDN to new cities. AT&T last week announced plans to offer Integrated Services Digital Network services in 11 additional cities by 1990. AT&T plans to provide ISDN Primary Rate Interface service to 73 cities by the end of this year and to 110 cities by the end of 1990. The cities are: Akron, Ohio; Albany, N.Y.; Anaheim, Calif.; Arlington, Va.; Des Moines, Iowa; Knoxville and Memphis, Tenn.; Orlando, Fla.; Rochelle Park, N.J.; South Bend, Ind.; and Wichita, Kan.

OSI testing tool debuts. The Corporation for Open Systems (COS) and the Brussels-based Standards Promotion and Application Group (SPAG) last week released a jointly developed Integrated Tool Set (ITS) that can be used to test for standards conformance. ITS combines COS Open Systems Interconnection and SPAG Manufacturing Automation Protocol 3.0 conformance test software and, it runs on a Sun Microsystems, Inc. 3/160 workstation. ITS can be used to test the Message Handling System, File Transfer, Access and Management, connectionless network services and Transport Class 4 protocols. The tool set can be used for COS Mark certification of the latter two applications. ITS can be purchased or used as a service at COS laboratories or at COS-accredited test centers.

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Despite the decision by American Airlines and Delta Airlines to scrap a proposed merger of their computer reservation systems, observers say consolidation of these nets in the U.S. and abroad will continue as carriers try to achieve economies of scale. **Page 21**

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Scott Instruments recently announced a personal computer-based speech recognition system that can recognize as many as 160 words from any speaker. **Page 25**

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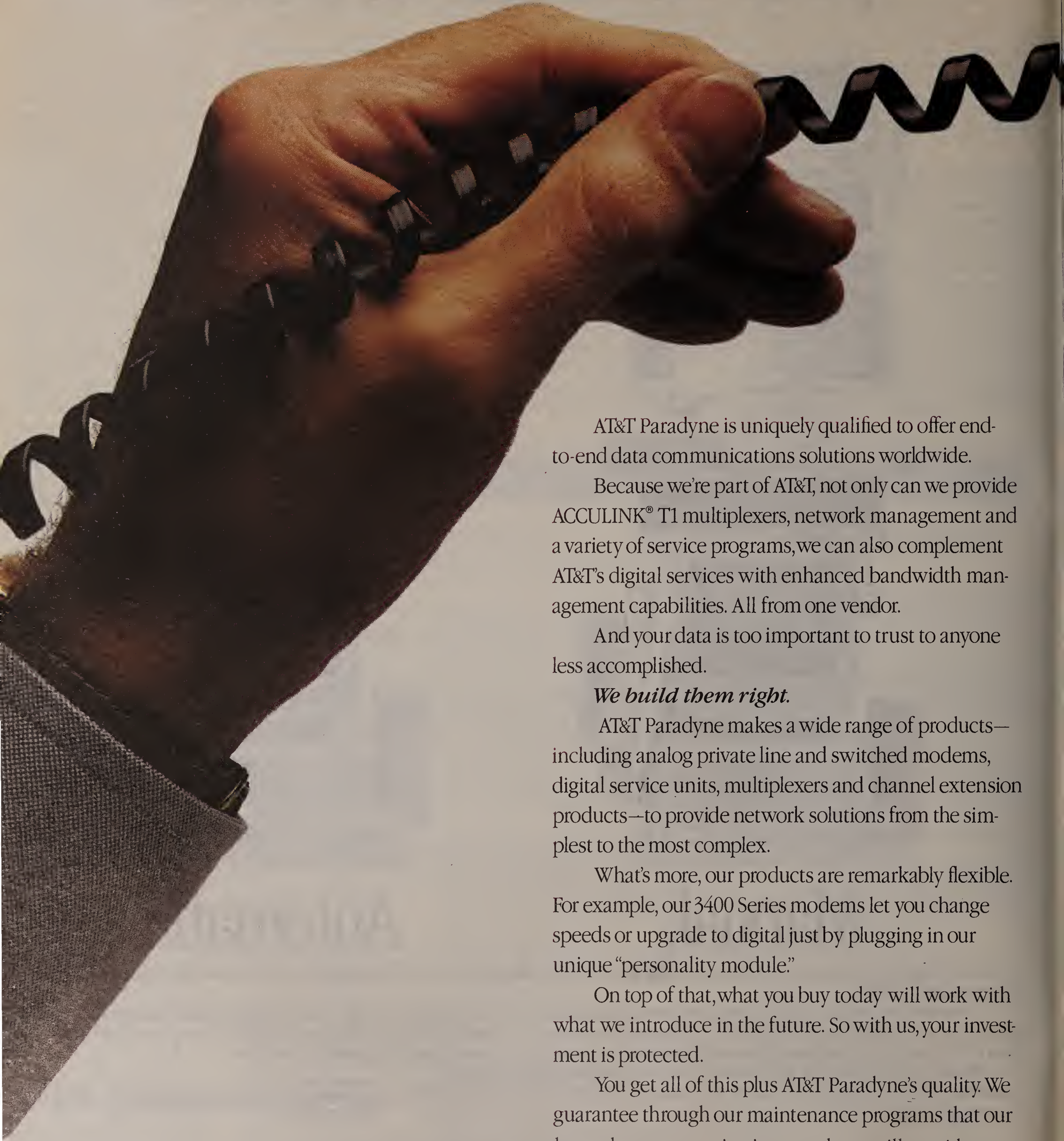

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ISDN equipment problems hamper service acceptance

By Bob Wallace
Senior Editor

Bugs in Integrated Services Digital Network station equipment represent a menacing obstacle on the road to widespread acceptance of ISDN.

Almost two years after the first ISDN call was placed, pioneering users say they still spend too much time and resources evaluating ISDN station equipment.

One ISDN pioneer, West Virginia University (WVU) in Morgantown, set up an ISDN laboratory to test the reliability and functionality of ISDN station equipment after signing up for 4,900 lines of digital Centrex, including 660 ISDN Basic Rate Interface lines.

WVU funded the project and provided space for the lab, while many vendors donated or loaned equipment. The Chesapeake & Potomac (C&P) Telephone Co. of West Virginia ran 20 Basic Rate Interface lines into the facility.

"The only way we could make sure that ISDN [equipment] worked as promised was to set up our own lab and do the testing ourselves," said Myra Wright, an information systems planning associate with WVU's computing and information resources office. "You don't have the opportunity to test the equipment during vendor demonstrations."

The university tested single-line ISDN telephone sets and terminal adapters to see if they would support ISDN voice features and synchronous and asynchronous data transmission. Although Wright would not say how the gear fared, she did say, "It's been a real interesting process."

Jeff Fritz, a data communications analyst for WVU, called the ISDN station equipment relatively stable, but he said some of the ISDN telephone sets tested did not work at all. "Equipment that says ISDN on it doesn't always do what vendors claim it will."

Fritz said the school also ran into a problem with the routine diagnostics performed by the AT&T 5ESS central office switch anchoring the school's network. The 5ESS takes all Basic Rate Interface lines down once a day for testing when they are not in use. "But when the lines come back up, some ISDN telephone sets, terminal adapters and PAD [equipment] doesn't come back on-line," he said.

Despite the setbacks, Fritz praised C&P and its ISDN equipment vendors for their continued service and support. "C&P, in particular, has been extremely cooperative in working with us to address [these problems]."

A second user, North Carolina State University at Raleigh, is considering implementing a private ISDN network and is planning to build an ISDN lab, in part to test station equipment for use in the network.

"We need to know which equipment is ISDN-compatible and which isn't," said George Abbott, telecommunications director for N.C. State. Abbott suspects

(continued on page 8)

DEC expands software services in NAS family

By Laura DiDio
Senior Editor

BOSTON — As expected, Digital Equipment Corp. last week bolstered its Network Application Support (NAS) strategy with the introduction of three additional software services that simplify the way users access applications across DECnet networks.

DEC also rolled out three Ultrix-based servers based on Reduced Instruction Set Computer (RISC) technology, each of which supports between 64 and 300 users ("DEC set to announce Unix servers and net software," *NW*, July 10).

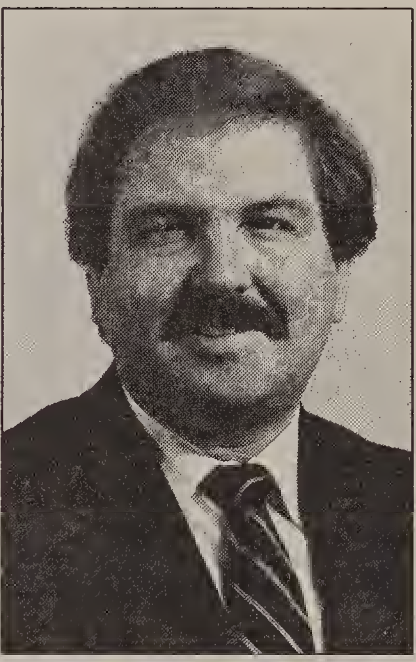
DEC's NAS architecture, introduced in January 1988, is intended to provide a common set of software services linking applications and data bases on a variety of computer systems, servers and desktop devices across DECnet.

NAS supports systems based on DEC's VMS and Ultrix operating systems; DEC VT-style terminals; DEC VMS-based workstations; DOS- and OS/2-based personal computers; Apple Computer, Inc. Macintoshes; DEC Unix workstations; and X/Window System-based terminals.

The latest NAS software services, which include VAX SQL Services, the Compound Document Architecture (CDA) Converter Library and DECprint Services, bring to 12 the number of services available under NAS, said Howard Woolf, manager of DEC's NAS marketing group.

- **VAX SQL Services** software provides a standard method for applications to access VAX Rdb/VMS or IBM DB2 relational data base management systems, both of which are based on SQL. A server portion of VAX SQL Services software resides on a VAX or IBM host, while a client portion is embedded in the application.

Prior to VAX SQL Services, there was no common way for users to access both DEC and IBM data bases, Woolf said. "Users had to know a complex set of commands to gain access to different data bases," he said.



DEC's Howard Woolf

VAX SQL Services client software costs $7,250 per processor, while the server portion for IBM mainframes is priced at $35,700. The server portion for VAXes is included at no charge with DEC's Rdb, which costs $15,000. VAX SQL Services is available now.

- **CDA Converter Library Version 1.0** allows VMS and Ultrix systems, personal computers, workstations and Macintoshes to share revisable-form text documents, images, graphics and data across a network.

The software converts information into a common format — either DEC's CDA Document Interchange Format or Table Interchange Format for spreadsheets. CDA Converter Library Version 1.0 is available now for $200.

- **DECprint Services** software allows users to print a file to any DEC printer or supported third-party printer on the network.

DECprint Services obviates the need for detailed commands to print documents. The user calls up a print menu that displays all available printers on the network and selects the appropriate printer. Previously, users had to list specific commands telling the system how, where and what to print.

DECprint Services will ship this fall, and pricing has not yet been set.

Well received

Analysts attending last week's press conference hailed the announcements.

"The availability of NAS services ensures that even if the company doesn't sell desktop hardware, it will still be able to integrate other vendors' hardware into DEC networks, regardless of the hardware architecture or operating system," said Terry Shannon, manager of the DEC advisory service at International Data Corp., a market research firm in Framingham, Mass.

Judith Davis, senior consultant at Patricia Seybold's Office

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Senate issues RFP for data network

By Gail Runnoe
Washington Correspondent

WASHINGTON, D.C. — For the second time in two weeks, the U.S. Senate has spurned the services of Federal Telecommunications System (FTS) 2000, this time by issuing an RFP for a nationwide X.25 data network.

Earlier this month, the U.S. Senate and House of Representatives declined to purchase voice network services on the FTS 2000 network, opting instead to purchase virtual network service from MCI Communications Corp. ("Congress opts for MCI service over FTS 2000," *NW*, July 10).

With the new Senate Data Communications Network (SDCN), existing local networks and wide-area links will be replaced with an X.25 packet-switching backbone linking new local nets and other devices in offices around the country. The Senate's current 10-year-old network was described by one official as outdated and insufficient to serve the Senate's growing data needs.

SDCN will support on-line information retrieval, electronic mail, file transfer and interactive file access, and it will adhere to the Government Open Systems Interconnection Profile.

The current Senate network includes 20 Ethernets that give legislators access to information on minicomputers in Senate committee offices. The local networks support 4,000 terminals and many of the Senate's 2,000 personal computers.

Offices maintained by senators in their home states also have access to the minicomputers through Develcon, Inc. data switches in the Senate Computer Center here.

SDCN will support communications among approximately 9,000 users at close to 400 locations around the country.

The SDCN request for proposal calls for a leased X.25 network that will allow users in offices here and in all 50 states to exchange messages and files, as well as access information on host systems. Minicomputers in offices here and in larger state offices will be linked via native X.25 interfaces to packet switches, and local nets will support X.25 gateways to the switches. Smaller offices with personal computers and terminals will be equipped with packet assembler/disassemblers.

The RFP stipulates that contractors plan for migration to Integrated Services Digital Networks, and that they include a proposal to provide end-to-end data encryption.

The contractor that provides SDCN will be required to also supply integrated network management services for local- and wide-area networks.

George White, architect of the capitol at the Office of the Architect of the Capitol, said both the MCI contract and proposed Senate data network contract are small procurements relative to the FTS 2000 contract.

While the MCI contract is estimated to be worth between $5 million and $10 million annually, no value was released for the SDCN contract.

When the SDCN project was started about two years ago, uncertainty surrounded FTS 2000, according to Robert Harris, director of information systems technology at the Senate Committee on Rules and Administration.

"We weren't sure what the total data functionality would be of FTS 2000. We had no confidence [at that time] that FTS 2000 would be where it is [today]," he said.

Unlike most federal agencies that are mandated to buy service from AT&T and US Sprint Communications Co. as provided under the FTS 2000 contract, the Senate and the House have the option of procuring separate services if they so desire, said Robert MacKichan, general counsel for the Government Services Administration.

The Senate said the SDCN contract should be awarded by April 1, 1990. Proposals on the project are due Oct. 2, and a bidder briefing will be held on Aug. 1.

It is expected that the new network will satisfy Senate data needs at least through the 1990s and into the next century.

The RFP calls for the wide-area network to be available nine months after the contract award and for local networks to be cut over after about a year.

The term of the contract will be from the date of the award to the end of the fiscal year, the RFP said, with options for extensions totaling up to 10 years.

Corrections: In the story, "Toll-free services market set for explosive growth," (*NW*, July 3), the location for Microtel, Inc. was incorrectly listed as being in Vancouver. Microtel's correct location is Boca Raton, Fla.

Also, since the article went to press, Microtel has moved up its marketing plans for its LaserPLUS 800 and LaserEXPRESS 800 services in Texas, marketed by Claydesta/ATC in Texas. These services are now available.

In the story, "Vendors worldwide find favor with ISDN ventures," (*NW*, July 3), the name of the president and chief executive officer of NTT America, Inc. was misspelled. The proper spelling is Keiji Tachikawa.

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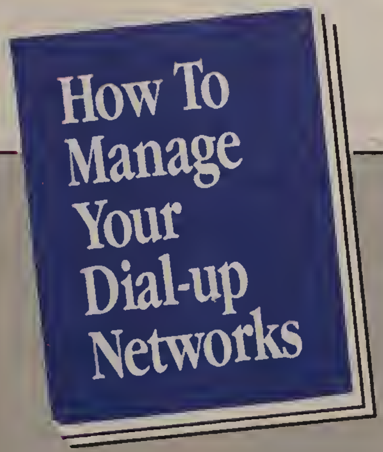

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States take steps to crack down on network hackers

Legislation aimed at preventing net virus attacks.

By Bob Brown
Senior Editor

ALBANY, N.Y. — State governments have taken notice of high-profile computer virus and hacker incidents and are proposing legislation aimed at boosting the security of their nets and cracking down on computer crime.

Among the states leading the effort are California, Florida, New York and Pennsylvania. They all have passed or are awaiting approval of legislation designed to shore up network security by outlawing virus attacks or requiring state agencies to adopt network security measures.

Just last month, New York State Sen. Roy Goodman (R-Manhattan) called for stiffer computer crime penalties and proposed creation of a central agency to oversee compliance with computer network security standards by state agencies.

Goodman, whose office released a study entitled "Beware Computer Virus Attack," also called for the formation of "commando forces" whose job it would be to quickly track down and wipe out computer viruses in state networks.

"Without a centralized state policy, we'll get what we have now — an uneven pattern of handling computer security problems," Goodman told *Network World.*

No time to waste

The need for comprehensive, statewide net security guidelines is increased by the state's proposed Empire Net, which will connect more than 8,000 computers in state agencies ("Empire Net helps N.Y. in cutting costs," *NW,* Oct. 17, 1988).

The New York State Assembly is not expected to act on Goodman's proposals until next year.

Goodman said New York must follow the lead of other states that have already taken action regarding network security.

Florida was among the first states to recognize the threat of computer break-ins, according to Jeff Davis, security consultant for Florida's Information Resource Commission, a state computer organization that is working with state agencies to help them institute a standard set of network security measures.

Florida agencies currently use a statewide backbone network for voice communications and are in the process of migrating their data traffic onto the backbone.

> Goodman called for "commando forces" to track down and wipe out computer viruses.

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More than one way . . .

Security standards are one way to prevent a network security breach in one agency from affecting the state's 27 other agencies, Davis said.

Florida is also exploring ways to protect commercial networks from hackers. A recent study issued by Florida's Department of Law Enforcement on Computer Crime revealed that one in every four businesses surveyed was a victim of computer crime during a specified 12-month period. Many respondents reported losses of several hundred thousand dollars, said Jeff Herig, a department special agent.

"We've got to be on top of computer viruses," Herig said. "Florida has historically been on the forefront of emerging crime problems."

One significant study finding that the Law Enforcement Department has already begun acting upon is the shortage of law enforcement officials familiar with the workings of computers and networks, Herig said.

"We have a whole generation of law enforcement officers not raised on computers," Herig said. "We've got to teach them a new set of skills."

Other leading-edge states

The Pennsylvania Legislature's Budget and Finance Committee last fall released a study called "Computer Viruses and their Potential for Infecting Commonwealth Computer Systems." As a result, a computer crime bill is now awaiting House approval.

According to one state attorney familiar with the study, the bill would amend an earlier computer crime code by making hackers more accountable for the damage they cause through their attacks on networks and computers. As networks grow, the potential for major damages also grows, the attorney said.

One way to discourage would-be hackers from infiltrating networks is "to put more teeth into existing computer crime laws," said an aide to California State Sen. Art Torres (D-Los Angeles).

California is doing just that by revising its definition of "computer networks" and banning academic institutions from awarding degrees related to computer sciences to persons convicted of computer crimes. The measure has cleared the California Senate and is in the state Assembly before the Committee on Utilities and Commerce, he said.

State governments have been joined by the federal government in trying to make their computer networks more secure and deterring would-be hackers.

In 1986, Congress passed the Computer Fraud and Abuse Act, which makes it a crime to knowingly gain access to a government computer and alter its operation so as to disable it. Last July, the Computer Virus Eradication Act of 1988 was introduced in the U.S. House of Representatives to make it a federal crime to plant a virus in a computer system.

AT&T cuts rates on private lines

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must only give 14 days' notice.

This is the first major tariff revision filed that exceeds the 5% limit, and observers said it indicates how aggressive AT&T has become on pricing. Some said they believe AT&T is testing the water with this filing and that, if the carrier gets approval, it will follow with price cuts that go below the floors for other categories of service.

New details

AT&T revised the pricing structure and lowered pricing for its Accunet T1.5 and T.45 (T-3) services.

The new pricing can save users up to 34% off the current rates for T-1, which is currently offered at a per-circuit rate of $1,800 a month plus $12 per mile.

Under AT&T's revisions, rates for T-1 lines would fall into three mileage bands. Circuits between one and 50 miles would cost $1,800 a month plus $10 per mile; circuits between 51 and 100 miles would cost $1,825 per month plus $9.50 per mile; and circuits of more than 100 miles would cost $2,025 per month plus $7.50 per mile.

For example, a user with a 500-mile T-1 circuit would pay $7,800 a month, but would only pay $5,775 under the new pricing, a savings of more than 25%.

New pricing for T-3 circuits offers users a maximum of 42% off current pricing of $6,000 per circuit plus $180 per mile.

Rates would now be based on four mileage bands, ranging from $6,000 a month plus $175 per mile for circuits between 1 and 50 miles, to $13,500 per month plus $100 per mile for circuits of more than 200 miles.

AT&T also expanded its discount plan for low-volume customers of T-1, T-3 and Dataphone Digital Services. The discount structure, which is based on length of commitment rather than volume, allows customers to commit to two- and four-year contracts in addition to the previous one-, three- and five-year terms.

Discounts on T-1 and T-3 services range from 10% off monthly prices for a one-year commitment to a 24% discount for a five-year commitment. Discounts for Dataphone Digital Service would range from 4% off monthly prices for a one-year commitment to a 12% discount for five years.

New ways to commit

Also revised was AT&T's Multiservice Volume Pricing Plan, which allows customers to aggregate traffic from Dataphone Digital Service, T-1 and T-3 services in order to meet volume commitments. AT&T will now allow users to count traffic from its International Accunet Digital Service and Accunet Spectrum of Digital Services toward meeting monthly volume commitments.

The carrier lowered the minimum monthly volume at which customers qualify for discounts from $25,000 to $10,000, and it also added two intermediate volume levels — $350,000 and $750,000 — to the six existing levels.

For Dataphone Digital Service and T-3 services, AT&T is requesting only modest increases in discounts. But for T-1, AT&T's new rates would be discounted as much as 21% below the previous rates.

Analysts have widely predicted that aggressive price cutting was likely this year for high-capacity digital services, particularly T-1. Some say AT&T's reductions signal the beginning of a price war.

ISDN problems slow acceptance

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some devices marketed as ISDN equipment are not even ISDN-compliant.

Norman Sefton, telecommunications director for Duke University in Durham, N.C., said his school has had marginal equipment problems. Duke uses an on-premises AT&T Network Systems Group 5ESS central office switch to support its ISDN private net.

"Although we haven't had any major problems with the apparatus, we did have some trouble with attendant consoles in our network," Sefton said. "Early ISDN consoles had bugs in them. They had chip problems and software problems as well. We had instances where all the lights lit up and the console locked up. None of the console buttons would work when this happened."

The vendor, which Sefton declined to identify, solved the problem by replacing the erasable, programmable read-only memory chips in the consoles.

General Electric Aircraft Engine of Cincinnati cited the lack of reliable ISDN station equipment as a major factor in its decision not to buy into an ISDN Centrex service proposed by Cincinnati Bell Telephone.

After participating in a yearlong study evaluating the potential benefits of migrating to ISDN Centrex, GE Aircraft concluded that the time wasn't right for ISDN ("GE unit decides to pass on ISDN after yearlong study," *NW,* June 19).

AT&T and Cincinnati Bell proposed that GE Aircraft install 16,000 Basic Rate Interface Centrex lines to support 80 sites in three locations. But the promised benefits did not outweigh users' concerns about ISDN and the lack of ISDN products, said Tom Pogue, a telecommunications programs senior specialist with the company.

New GOSIP version debuts

continued from page 2

According to the draft of the standard, users at government agencies will be able to transmit data over ISDN D channels, B channels or both. When B channels are employed, users can opt to support the transmission on an as-needed or switched basis, or they can dedicate the channel to data support.

Jonathan Gloster, a member of the technical staff at the Corporation for Open Systems (COS) in McLean, Va., said the lack of ISDN in Version 1 was a major drawback of the document. But because the latest revision only addresses data services applications of ISDN, users will soon demand guidelines for transmission of voice data using ISDN services.

Data services not in demand

"Data services is probably not in the highest demand for ISDN right now," he said, adding that voice and telephony standards would have a much stronger user impact.

Marvin Chartoff, senior manager at the Ernst & Whinney/Network Strategies consulting practice in Fairfax, Va., said that adding ISDN to the specification will only have a limited effect on users because most carriers do not yet provide the services.

Claude Stone, vice-president of electronic data interchange market development at the First National Bank of Chicago, and vice-chairman of the ISDN Users' Workshop of the North American ISDN Users' Forum, disagreed. He said GOSIP's inclusion of ISDN could help spur user acceptance of the technology.

"It appears that ISDN is beginning to move from a myth to some level of reality," he said. Although GOSIP specifications will apply only to government users, Stone said private sector companies should follow GOSIP developments because the specification ultimately will effect how they do business with federal agencies.

INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

The computer industry is expected to be the biggest spender on R&D in 1990, spending some $21.1 billion, according to "R&D Ratios & Budgets," a study by management consultants Schonfeld & Associates, Inc. of Evanston, Ill. In the telecommunications arena, ending business restrictions on the RBHCs may be needed to increase R&D spending, the report said.

People & Positions

Rod Mack last week was named vice-president of product development at **US Sprint Communications Co.** in Kansas City, Mo.

Mack's new responsibilities include coordinating and driving the product development process, including management of detailed product specifications and schedules.

Previously, Mack was vice-president of operations for United Telephone Co. of Indiana.

Lyle Coffman has been named senior vice-president of sales and marketing at **InteCom, Inc.**, an Allen, Texas-based subsidiary of Wang Laboratories, Inc.

Coffman's responsibilities will include management of the private branch exchange maker's U.S. regional sales, national accounts, government accounts, market planning, sales support and advertising.

Previously, InteCom President and Chief Executive Officer Thomas Mayer managed these areas.

Coffman comes to InteCom from Rockwell International

(continued on page 10)

MCI adds discount plan for international private lines

Pricing deal covers high-speed digital services.

By Tom Smith
New Products Editor

RYE BROOK, N.Y. — MCI Communications Corp. last week unveiled a discount pricing plan for international digital private-line services to rival a similar plan offered by AT&T.

The International Network Pricing Plan (INPP) is offered for MCI's Skyline satellite-based and Fiberline fiber-optic-based international services. INPP takes effect Aug. 1. Both digital services are offered at speeds ranging from 56K bit/sec to 1.544M bit/sec T-1 rates.

Discount levels depend on monthly spending and the length of service commitment.

The plan also enables users to achieve commitment levels by bundling international charges with those incurred under MCI's domestic Network Pricing Plan (NPP). NPP covers MCI's DDS 56 (a 56K bit/sec digital data service), TDS 1.5 (a T-1 service) and TDS 45 (a 45M bit/sec T-3 service).

INPP's fixed costs, discount schedule and length of commitment options are identical to those offered by AT&T for its International Accunet Digital Services and Skynet International Service.

Although both carriers offer discounts based on monthly commitments of $5,000, $25,000 and $40,000, MCI will also offer a discount tier for those that spend a minimum of $65,000 per month.

Customers can apply savings earned through the INPP discount structure to monthly bills for these MCI services: telex, cablegram, packet-switched services and MCI Mail.

AT&T does not offer the option of using domestic service bills to meet international discount requirements.

However, the carrier recently revised its Multi-Service Volume Pricing Plan (MSVPP) to allow customers to group international service along with domestic services to obtain MSVPP discounts, according to an AT&T spokesman.

The other distinction is that

(continued on page 10)

INDUSTRY BRIEFS

Ameritech last week announced a corporate reorganization that resulted from a yearlong internal study.

The reorganization is designed to "speed up the decision-making process" at Ameritech and to be "the first step in an evolutionary process of positioning Ameritech for a changing marketplace," said William Weiss, Ameritech chairman and chief executive officer.

Ameritech announced a number of executive changes as a major part of the reorganization.

Ormand Wade, president of the Ameritech Bell Group, was elected to the newly created position of vice-chairman of Ameritech with responsibilities for corporate communications, government affairs, human resources and corporate legal affairs.

Robert Barnett, president of the Ameritech Enterprise Group, was named president of the Ameritech Bell Group strategic business unit, succeeding Wade.

William Vititoe, president of Michigan Bell Telephone Co., was named president of Ameritech Enterprise Group.

The reorganization does not include any major changes in corporate structure, but an effort will be made to better integrate Ameritech's five Bell operating companies with other parts of the Ameritech Bell Group, including Ameritech Applied Technologies, Ameritech Information Systems and Ameritech Services, Inc. Decisions made at the BOCs will be coordinated better with the rest of the Ameritech Bell Group divisions, an Ameritech spokesman said.

Network Management, Inc. (NMI) last week announced that it has acquired **LAN Services, Inc.**, a company that sells and installs a variety of local networks.

The acquisition price was not disclosed.

LAN Services installed 270 local nets last year and had

(continued on page 10)

Vitalink's current market offerings

Product	LAN	Features
TransLAN 320	Ethernet/802.3	Supports one or two remote links at speeds of up to 64K bit/sec. (Up to eight TransLAN 320s can be remotely linked to the TransLAN III or TransLAN 350.)
TransLAN 350		Supports two T-1 links or up to eight lower speed links.
TransLAN III		Supports one T-1 link or up to eight lower speed links.
TransRING 530	Token Ring/802.5	Links up to four remote 4M bit/sec token-ring local networks at speeds of up to 64K bit/sec.
TransRING 550		Links up to eight remote 4M bit/sec token-ring local nets at T-1 speeds.
WANmanager	Ethernet/802.3 or Token Ring/802.5	A workstation-based system that allows the network operator to monitor, analyze and control the complete 802 wide-area net by using a mouse, color icons, windows and pull-down menus.

GRAPHIC BY SUSAN J. CHAMPENEY SOURCE: VITALINK COMMUNICATIONS CORP., FREMONT, CALIF.

Challenges ahead for high-flying Vitalink

Local net interconnection company faces new rivals and a shifting technological landscape.

By Gail Runnoe
Washington Correspondent

FREMONT, Calif. — Vitalink Communications Corp. holds a dominant position in the exploding market for local network bridges, but analysts say its lead could slip as competition heats up and local net interconnection technologies begin to overlap.

Vitalink manufactures remote bridges, devices that link similar but geographically distant local networks. The company currently holds almost 70% of the wide-area bridge market and, up to now, its revenue has been growing at roughly 100% per year. Analysts said Vitalink has been successful because its products — often called routing bridges — combine basic bridge functions with important router features such as path control.

However, Mary Modahl, an analyst at Forrester Research, Inc., a market research firm in Cambridge, Mass., said that as both bridge and router companies increase the functionality of their products, "The routing bridge market segment that Vitalink now occupies could be subsumed."

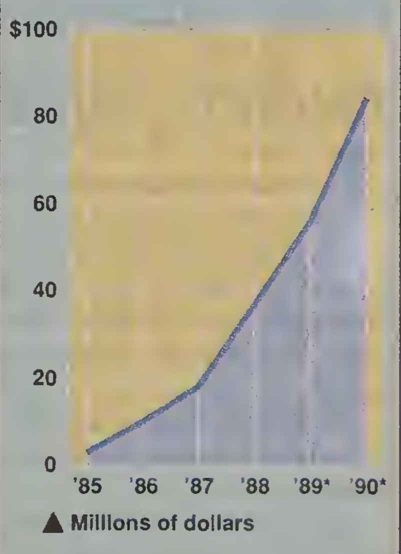
Although Vitalink has little competition in the remote bridge market now, more competitors are entering the market. "I'd be surprised if [Vitalink] has more than 50% [market share] by 1992," Modahl said.

But Paul Schaller, vice-president of marketing at Vitalink, said Vitalink has alway viewed itself as a major player in the overall network interconnection market. He agreed that technologies will be merging over time, and Vitalink's approach will be to supply products that serve specific customer needs in developing markets.

He said Vitalink has adopted a three-pronged strategy for sustaining its market growth: outstanding customer service, reliable products and new product capabilities.

As customers expand their networks, Schaller said, they will need additional technical support from vendors and more powerful network management capabilities. In response to these user concerns, Vitalink has set up a 24-hour-a-day manned service center and developed WANmanager, a software product to help monitor and manage bridges and wide-area connections.

Vitalink's revenues



*Projected

SOURCES: VITALINK COMMUNICATIONS CORP., FREMONT, CALIF., AND ROBERTSON, STEPHENS & CO., SAN FRANCISCO
GRAPHIC BY SUSAN J. CHAMPENEY

Modahl said Vitalink's strong market presence stems from its early entry into the wide-area

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Challenges for Vitalink

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bridging market. Originally formed as a satellite data transmission provider, "Vitalink realized the potential for a wide-area network business when most people in the local network market were still focused on connecting PCs to hosts," she said.

According to Modahl, Vitalink secured its place in the wide-area bridging market three to four years before other companies even started playing.

Vitalink's close relationship with Digital Equipment Corp. has played a key role in the success of Vitalink's sales and distribution efforts, said Richard Edwards, senior analyst at the San Francisco-based investment research firm of Robertson Stephens & Co.

Vitalink's Schaller said the company's relationship with DEC began in 1984 when the two vendors teamed up to develop Vitalink's first remote bridge, TransLAN, which links remote Ethernet local networks. The company now also makes a line of remote token-ring bridges called TransRING.

Schaller explained that, at the time, DEC was working on a way to connect Ethernets within a single building. Vitalink began exploring ways to link remote Ethernets over longer distances.

Vitalink and DEC signed a codevelopment and comarketing agreement for such wide-area bridges, Schaller said. DEC is now a major reseller of Vitalink's products and accounts for 40% of Vitalink's annual sales.

But Brad Baldwin, industry analyst at Dataquest, Inc., a San Jose, Calif.-based market research firm, warned that Vitalink should not depend too heavily on DEC as a distribution channel. He said DEC could begin offering products of its own that compete against Vitalink's offerings.

Baldwin said local net interconnection technologies are beginning to overlap — for example, companies are selling routers with bridging capabilities and bridges with routing capabilities. Soon, he said, all bridge, router and gateway technologies will eventually be competing in one large market. These technologies "are all going after the same dollar," he said.

In this aggregate market, DEC, which makes its own local and remote routers, currently holds 70% of the market, according to Baldwin. Even counting the bridges it sells to DEC, Vitalink's share of this aggregate market is only about 17%, he said.

Although DEC and Vitalink have been allies for over five years, "DEC could pull the plug on Vitalink at any time," Baldwin said. He believes Vitalink realizes its vulnerability and said the firm conducted a second round of financing last month to increase its strategic options.

Baldwin said Vitalink could use the cash to help it through rough times should its ties with DEC be severed, or if Vitalink should acquire another company or have to prevent a hostile takeover.

Over $30 million in capital was raised for the company last month when it issued more than two million new shares of stock that sold for $16.25 per share. When Vitalink went public in 1988, its stock sold for $8.25 per share.

Schaller, however, said the company's relationship with DEC is stronger than it has ever been, with DEC now marketing Vitalink products worldwide. But DEC, he added, is more than just a marketing partner. The companies also work together on product development. "The relationship is much deeper than an OEM deal."

Some analysts say it would be wise for Vitalink to strengthen itself by extending its reach into related network interconnection markets either through a merger, acquisition or joint venture agreement. Schaller did not rule out this possibility.

"We've always viewed ourselves as being in the local network interconnect business — not just the bridge market," he said. "We're also interested in routers, gateways and network management."

Vitalink's Paul Schaller

Schaller said Vitalink also plans to develop new markets in the Far East and coordinate its distribution channels in Europe. While the company currently markets its products in Japan, Schaller said Vitalink is planning to begin selling in other Asian countries.

Last April, Vitalink also opened a new headquarters for its European operations — Vitalink Europe, B.V. in Gouda, Netherlands. This office will act as a central sales and service office supporting Vitalink's independent distributors in 15 European countries.

Intel purchases front end maker Jupiter Technology

By Sarah Vandershaf
West Coast Correspondent

SANTA CLARA, Calif. — In a move to broaden its line of data communications products, Intel Corp., based here, recently announced the acquisition of Jupiter Technology, Inc. of Waltham, Mass. Terms of the sale were not disclosed.

Intel markets a line of Fastpath 9750 control units. The Fastpath 9750 can be linked directly to the channel of an IBM mainframe and support high-speed communications with other hosts, local networks, wide-area networks and peripherals.

Softlink maker

Jupiter, which will become a wholly owned subsidiary of Intel, manufactures the System 100 and System 1000 front-end processors that support a variety of network protocols through the company's Softlink software.

Company officials said the Jupiter products will extend the wide-area connectivity capabilities of the Fastpath products. The Jupiter processors can be used to link Fastpath units at remote sites, said Roger Thomas, general manager of Intel's Phoenix-based systems interconnect operation, which developed Fastpath.

Intel has not yet decided how the products will be merged into one product line, but the products already work together, he said.

For instance, if Fastpath is connected to a mainframe as a Transmission Control Protocol/Internet Protocol controller, a Jupiter front-end processor can switch the TCP/IP protocol to X.25 and send the data out to remote sites, he said.

Thomas said customers will be able to purchase products from a single vendor that can link an IBM host to other mainframes locally at high speeds over an IBM channel. They will also be able to use the Jupiter products to link the host to remote sites over T-1 lines, Thomas said.

More flexibility

Merging the product lines will also give Intel more flexibility in responding to the needs of users, Thomas said. The Jupiter products can be used without Fastpath as front-end processors but not at the 4.5M byte/sec speeds supported by Fastpath. So a user that cannot afford Fastpath, which costs between $40,000 and $150,000, can start with the Jupiter processors, which are priced starting at $10,000, he said.

James Flach will continue as Jupiter's president and chief executive officer, Thomas said. No layoffs are expected as a result of the acquisition.

MCI adds discount plan

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MCI services included in the combined pricing arrangements affect only digital circuits, whereas AT&T's plan covers both analog and digital circuits.

Under MCI's plan, the higher the monthly spending commitment and the longer the contract, the steeper the discount:

- MCI users that commit to spending $5,000 per month for one year receive a 5% discount. They receive a 15% discount for a three-year commitment and a 20% discount for a five-year commitment.
- A $25,000 monthly commitment for one year will receive a 7% discount; for three years, 17%; and for five years, 22%.
- Users that agree to spend $40,000 per month for one year will save 10%; for three years, 20%; and for five years, 25%.
- Users committing to spending $65,000 per month for one year will receive a 14% discount. They will receive a 24% discount for three years and a 29% discount for five years.

For example, a user with a 56K bit/sec fiber link between San Francisco and Europe, which costs $7,500 per month, will save $375 by making a one-year revenue commitment of $5,000 per month. A user with a T-1 fiber link between the same sites, which costs $66,250 per month, can save $19,212.50 by committing to spending $65,000 per month over five years.

INPP is offered as part of MCI's Global Network Plan to win users' business on a global basis, according to Russell Jay, manager of international private-line products. "MCI is saying, 'Bring us your international private network, and we'll generate global benefits for you.' "

The discount plan is important in light of the increasing prevalence of international networks, according to Jeff Close, senior consultant with DMW Group, Inc. in Stamford, Conn.

"MCI is looking for a way — instead of reducing rates for everyone — to somehow look attractive to large customers," Close said. "So they've made an arrangement for the large customer to get an advantage."

People & Positions

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Corp.'s Switching System Division in Chicago, where he was national sales director.

George Vasilakos was named president and chief operating officer of **Com Systems, Inc.**, a Van Nuys, Calif.-based telecommunications service provider.

Vasilakos will assume the day-to-day operating responsibilities for the company, giving Chairman and Chief Executive Officer **Rex Licklider** more time to focus on acquisitions and strategic planning.

Previously, Vasilakos was president and CEO of ALC Communications Corp.

Richard Barale last week was named director of marketing for **TeleSciences Transmission Systems, Inc.**, a Fremont, Calif.-based digital microwave and lightwave transmission product firm. Barale said his responsibilities include market opportunity analysis and new product development.

Previously, Barale served as director of market planning for the Farinon Division of Harris Corp.

Gerald Butters was appointed executive vice-president of marketing at **Northern Telecom, Inc.** in Nashville.

Butters is responsible for Northern Telecom's seven regional marketing vice-presidents and their premier account activities, as well as all Northern Telecom marketing and sales.

Previously, Butters was vice-president of marketing, Integrated Network Systems for Northern Telecom. That post will be filled by **J.A. Craig.**

In his new position, Craig is responsible for sales, installation, field service and marketing development for the regional Bell holding companies and independent operating companies' customer base.

Industry Briefs

continued from page 9

revenue of more than $10 million. The local network company said it expects 1989 revenue to reach $18 million.

NMI, which was founded in 1986, is a systems integration firm that specializes in network management. LAN Services is the fifth company to be acquired by NMI, which is based in Fairfax, Va.

Oracle Corp. last week reported record revenue and earnings for its fourth quarter, ended May 31, as well as for its 1989 fiscal year. Oracle, a Belmont, Calif.-based maker of relational data base management software, reported fourth-quarter revenue of $216 million, up 107% from $104 million in the fourth quarter of fiscal 1988.

Earnings increased 76% to $33 million, compared to $19 million in the fourth quarter of fiscal 1988.

For the fiscal year 1989, Oracle reported revenue of $584 million, up 107% from $282 million in fiscal year 1988. Earnings grew 91%, to $82 million for the fiscal year compared to $43 million the year before.

TELECOMMUNICATIONS

CARRIER SERVICES, CENTREX, CPE, WIRING SYSTEMS AND BYPASS

Worth Noting

Nippon Telephone and Telegraph, Ltd. recently agreed to buy an AT&T high-speed optical communications system for use in its long-distance network. The sale, valued at $154 million over four years, represents the first major Japanese acquisition of U.S. optical network equipment.

Carrier Watch

Williams Telecommunications Group, Inc. (WTG) recently announced that it will provide route diversity for customers of its private-line services.

With route diversity, WTG will provide geographically separate interexchange facilities for customers using multiple 45M bit/sec T-3, 1.544M bit/sec T-1 and 56K bit/sec digital data circuits.

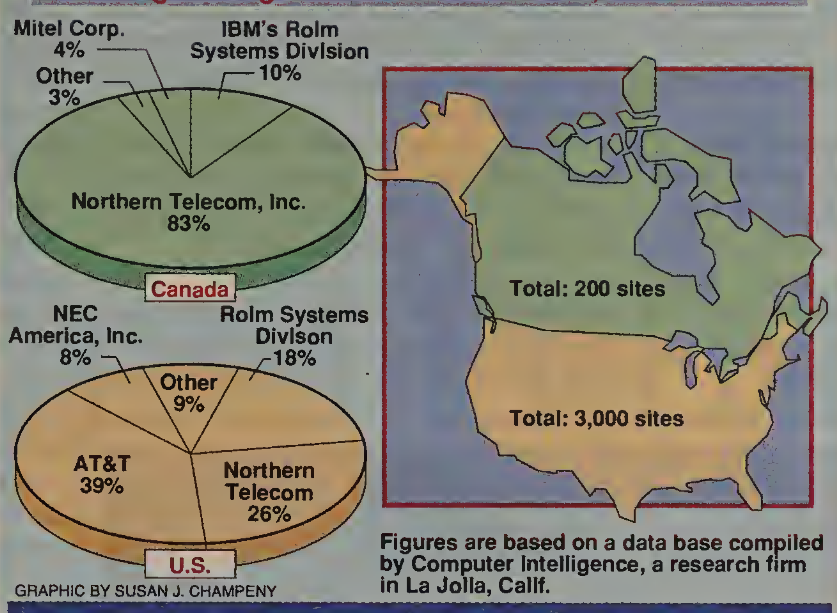
The company said it will charge the same amount for the diversely routed circuits as for the links routed along the primary path, even though the alternate route is typically longer.

The WTG fiber-optic network includes more than 11,000 route miles.

Southern Bell Telephone and Telegraph Co. recently cut over a fiber-to-the-home network in Heathrow, Fla., that supports digitally switched television signals.

The system, designed by Northern Telecom, Inc. for the community, is the first of its type to support video, voice and data over the same fiber. The project will provide the highest quality television possible today and will facilitate provision of a number of interactive home video services, such as video on demand.

Residents will also receive Integrated Services Digital Network capabilities. ☐



North American PBX market leaders

PBX usage at large sites with more than 1,000 extensions

Figures are based on a data base compiled by Computer Intelligence, a research firm in La Jolla, Calif.

GRAPHIC BY SUSAN J. CHAMPENY

Telemarketing service aids TV advertising campaigns

New offering answers 20,000 calls per minute.

By Paul Desmond
Senior Writer

LAMBERTVILLE, N.J. — An entrepreneur based here is readying a high-capacity telemarketing service targeted at retailers whose television advertisements generate thousands of calls to a toll-free number.

Bernard Riskin's call answering service, which will be based on a network of workstations tied to a central office telephone switch, can answer about 20,000 calls per minute, or 333 per second.

The system answers incoming calls with a recorded message, captures the caller's phone number using automatic number identification (ANI) and passes the inquiry on to the appropriate retailer near the caller's home. The retailer then returns the call while the potential customer's interest is still piqued.

Instalink offering

Riskin, a principal with and founder of Applied Telematics, Inc. (ATI) in Wayne, Pa., last year received a patent for another telemarketing service called Instalink.

With Instalink, customers can have calls placed to a single published number routed to their sales office closest to the caller's home ("Patented call-routing tool boon for retail industry," *NW,* Aug. 1, 1988).

The new service, dubbed ATI Network, will provide features similar to those of Instalink but on a scale large enough to accommodate the tremendous number of calls that televised advertisements can generate, Riskin said.

Users of both services are assured that potential customers will be connected with a sales representative soon after calling the 800 number, rather than reaching an operator who gives them another number to dial.

A key difference between the two is that a call answered by the ATI Network would not be immediately answered by a dealer. Instead, the system provides regional dealers with the phone numbers of potential local customers who used the 800 number to make an inquiry. Then the dealer returns the call.

Linking the country

Riskin is proposing to place workstations in about 12 major cities throughout the country. The workstations will be linked via high-speed lines to a central minicomputer. The minicomputer will be tied by a 56K bit/sec line to a central office switch at a long-distance carrier's point of presence in an as yet undetermined city.

Toll-free 800 lines will terminate at the point of presence, and the digital switch will use ANI to determine the phone number of the calling party. A recording will thank the caller and inform them that a dealer will call them back.

Calls are accepted on a "barge-in" basis, meaning callers may hear a message already in progress, Riskin said. This allows the system to answer calls more rapidly since each caller is, in effect, on a conference call with all the other callers.

"What we're doing is not connecting [callers] to anything but a recorded anouncement," Riskin said. ATI Network uses the same principle as a 900 line that can take 56,000 calls before anyone

(continued on page 12)

Alternative carriers gaining user favor

Customer confidence grows as providers offer flexible, responsive, high-quality service.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Ignoring the widespread skepticism of analysts and sometimes vocal opposition from the regional Bell holding companies, users appear to be increasingly open to the idea of purchasing telecommunications services from alternative local providers.

The reasons, they say, are simple. Alternative carriers are more flexible, more responsive and offer a higher quality network, typically using fiber-optic facilities.

Customers say there is no comparison between waiting two weeks for installation from an alternative carrier and waiting two months for installation at a higher price on less flexible terms from an RBHC.

Although many users are enthusiastic about using alternative carriers, some caution is in order. Many alternative carriers are young companies with limited capital, and they only serve selected portions of a city — often the primary business district and nothing else.

Customers of alternative carriers also say they sometimes encounter hostility from the RBHCs from whom they also purchase service.

One factor driving user interest in alternative carriers is an increasing level of customer confidence, said Anthony Pompliano, president and chief executive officer of alternate carrier Metropolitan Fiber Systems, Inc. (MFS) "After the initial sale, [customers] become comfortable with the service, and it's our experience that we begin to get all of their expansion work," he said.

MFS, which was founded in 1988, brought a network on-line in Baltimore last month and has others under construction in Boston, San Francisco, Los Angeles and Houston. Earlier this month, the company applied for a permit to build a network here.

(continued on page 12)

WASHINGTON UPDATE

BY ANITA TAFF

NTIA position close to being filled. Janice Obuchowski, the nominee for the top slot at the National Telecommunications and Information Administration (NTIA), appears to be headed for sure confirmation for the post.

Obuchowski, who is expected to replace Alfred Sikes as the director of NTIA and also serve as the assistant secretary of commerce for communications and information, appeared before the Senate Committee on Commerce, Science and Transportation in a brief hearing last week. Only two senators attended the proceeding — Sen. Daniel Inouye (D-Hawaii) and Sen. Larry Pressler (R-S.D.) — and both expressed support for Obuchowski.

The only questions raised by the congressmen concerned Obuchowski's ability to be objective in assessing industry issues. As the potential head of NTIA, Obuchowski will lead the agency that is responsible for advising the president on communications policy.

Prior to the nomination, Obuchowski served as executive director of international affairs at Nynex Corp., one of the regional Bell holding companies that has lobbied hard during the last year for greater market freedom. She is married to Albert Halprin, former head of the Federal Communications Commission's Common Carrier Bureau and now a partner in a Washington, D.C. law firm representing communications clients.

Obuchowski assured the congressmen that she had severed ties with Nynex and had filed necessary documents to remove herself from any proceedings that would appear as conflicts of interest. She said she had also worked out a similar plan to remove herself from any dealings in which her husband's involvement might create a conflict of interest.

Inouye said he expects the full committee to vote on sending Obuchowski's nomination to the Senate by August. ☐

Service aids TV ad campaigns

continued from page 11

gets a busy signal. The complete message will play twice before the call is disconnected so every caller is guaranteed to hear at least one full message.

After answering each call, the central office switch routes the digitized data detailing both the caller's phone number and the number the caller dialed to reach the nearby minicomputer. The minicomputer then routes the data to the workstation in the appropriate geographic region.

Drawing on its data base of area dealers, the workstation will then forward each caller's phone number to the dealer nearest the caller's home, either via facsimile or by file transfer to a personal computer at the dealer's site.

ATI President Ian Michel said his company is beginning the process of finding users for the new network. "The same people that a television station goes after to advertise are the same people we're going to go after to see if they want to use our ATI Network," he said.

ATI will especially target advertisers that buy time on major televised events, he said, such as the World Series or the Superbowl.

He said ATI is also looking into applications whereby ATI Network would send dealers not only callers' telephone numbers, but also their names, addresses and even credit histories. Different data bases are available — such as the post office's change of address data base — to provide such information, Michel said. ◻

Alternative carriers gaining user favor

continued from page 11

Robert Atkinson, counsel for Teleport Communications, one of the country's first alternative local carriers, agrees that users are more confident in the reliability of alternative operator services (AOS). Teleport has operational networks in New York and Boston and networks planned for Los Angeles, San Francisco, Chicago and Washington, D.C.

"A lot of major users have [become confident] that our quality is just about perfect, [so] now we're becoming their primary supplier," Atkinson said.

The primary users of Teleport — interexchange carriers and large financial institutions — cannot afford to have their networks go down for even a few minutes, Atkinson said. "If users diversify the sources [of telecommunications services], they can ensure that they will never be shut down."

Bob Maire, the project manager responsible for telecommunications at Morgan Stanley & Co., Inc. in New York, and a customer of Teleport, agrees that carrier diversity is one of the primary attractions of alternative carriers.

Morgan Stanley uses local services in New York from Teleport and New York Telephone Co., and it also runs a private microwave network. The facilities are used both for access to interexchange carriers and for communications between buildings. Maire said he is also planning to purchase service from MFS in Chicago. "I'm reducing my risk by spreading it over several carriers. The No. 1 thing is diversity," he said. Teleport is only slightly less expensive than New York Telephone.

Don Burns, director of industry relations for Mid Atlantic Telecom, a user on MFS' Baltimore network, acknowledges that the primary appeal of alternative carriers is quality and customer responsiveness, not cost savings. He said MFS' prices are only 10% below those of The Chesapeake & Potomac (C&P) Telephone Co. of Maryland, a local company of Bell Atlantic Corp. in Baltimore.

Mid Atlantic is a privately held company that resells long-distance services and provides AOS and 800 services in six states from Virginia to New York. It purchases service from MFS to reach its long-distance customers in Baltimore and to link facilities in Baltimore and Washington.

Flexibility wins customers

As an example of how MFS is more flexible than the RBHC, Burns said he asked C&P to match an installation date for new access lines proposed in a competitive bid from MFS. But the C&P said it could not meet the date because it would have to pull new cables. MFS, however, also had to install new cables.

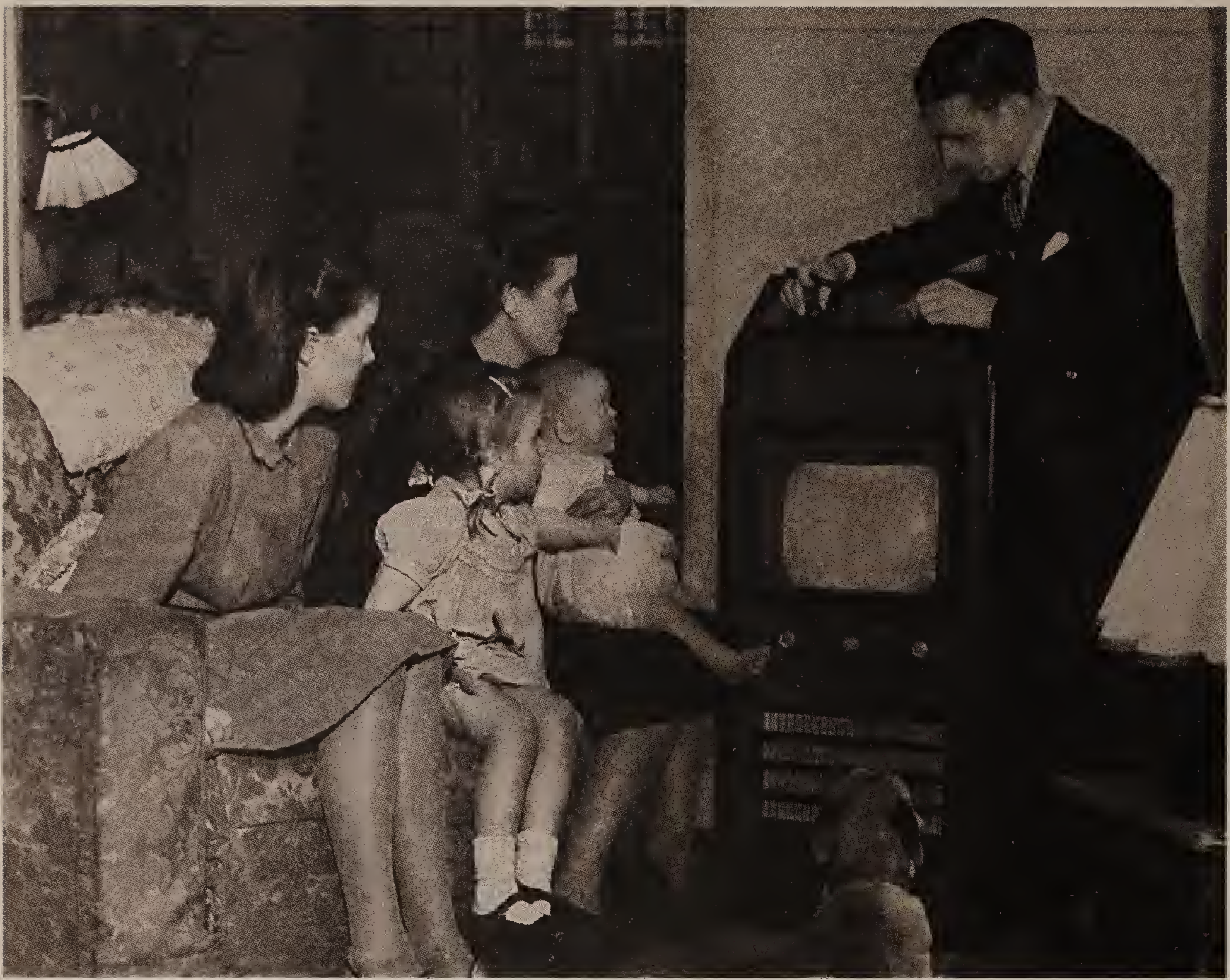
"So here we have the local utility, a regulated company that can spend any amount of money they want at the ratepayers' expense, not able to serve a customer as quickly as a privately funded company that has to operate in a truly competitive environment," Burns said.

Rosemary Ward, a manager responsible for telecommunications at Price Waterhouse, is also an MFS user. Price Waterhouse, a Big Eight accounting firm located in Philadelphia, is currently remodeling its building and has temporarily housed some employees in another location.

During the nine months it will take to complete the work, Price Waterhouse is purchasing two T-1 links between the buildings from MFS, enabling users in one building to dial out through the private branch exchange in the other building. The company's decision to go with MFS was a result of the inflexibility of Bell Telephone Co. of Pennsylvania, the RBHC serving Philadelphia, Ward said.

The RBHC would only sell Price Waterhouse a T-1 link for 24 months with a hefty $8,000 early termination penalty, Ward said. MFS, however, was willing to supply the T-1 link for as little time as Price Waterhouse needed.

Although Price Waterhouse currently does not purchase access to interexchange carriers through MFS, it will start negotiations with the alternative carrier this month, Ward said. ◻



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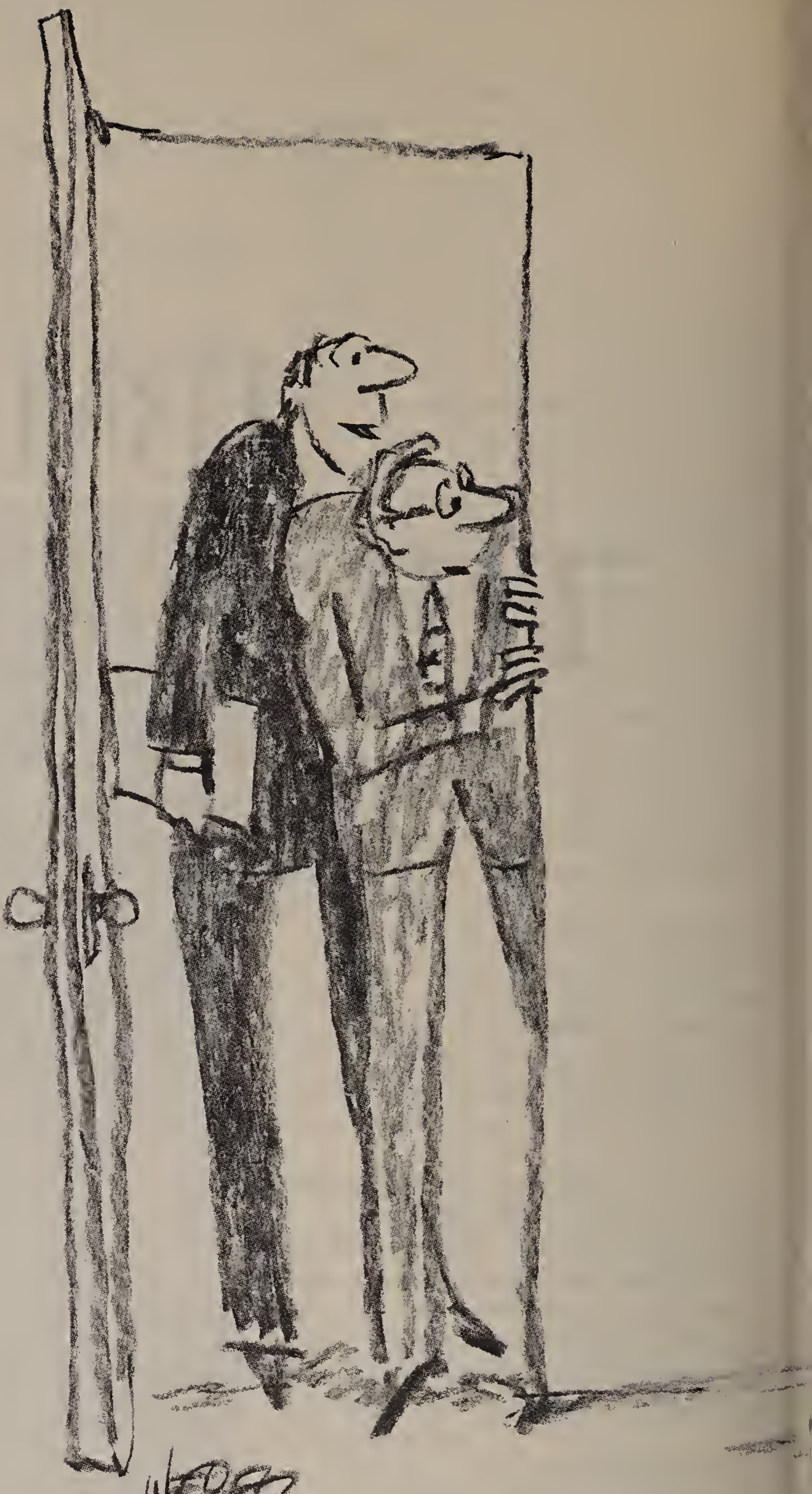

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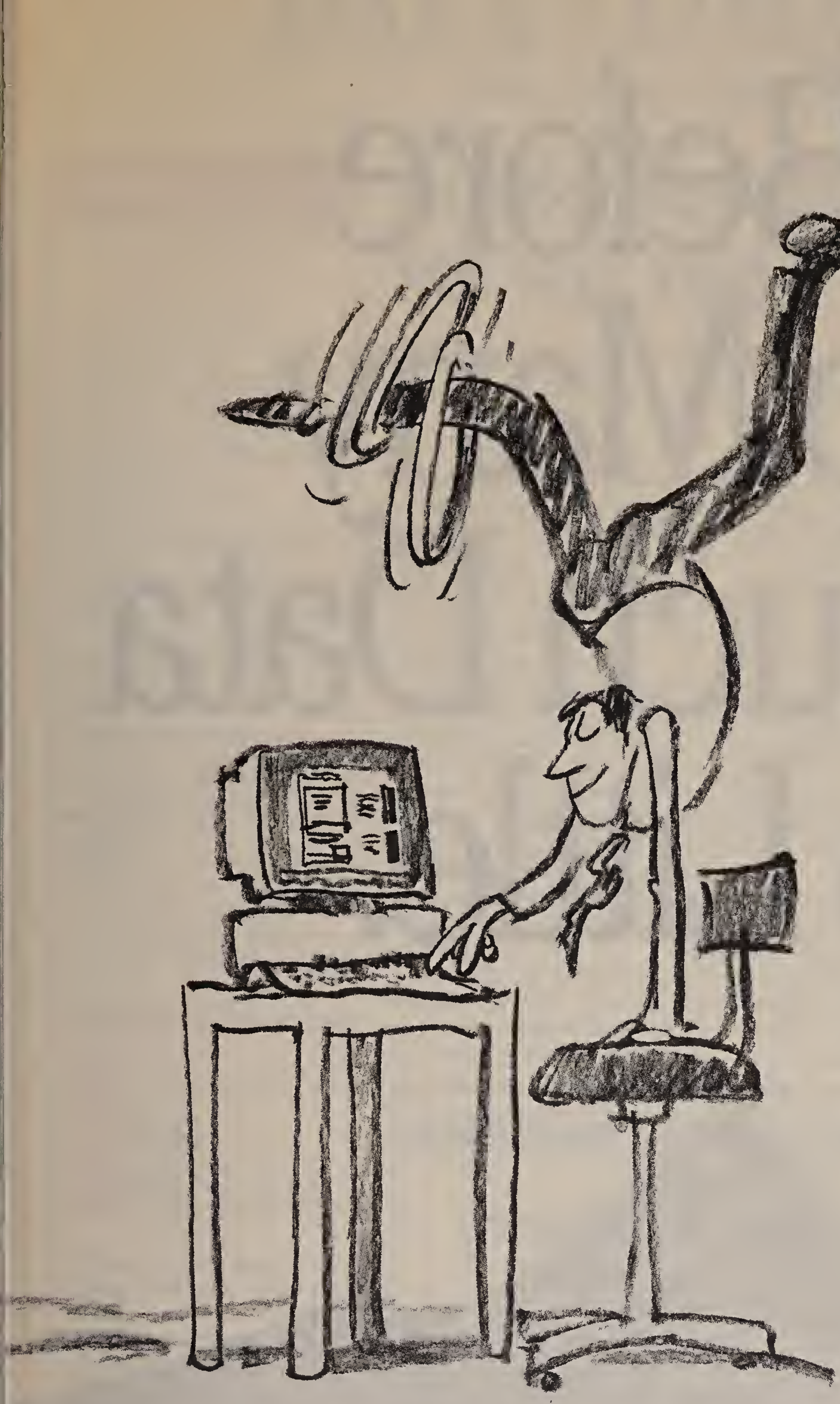

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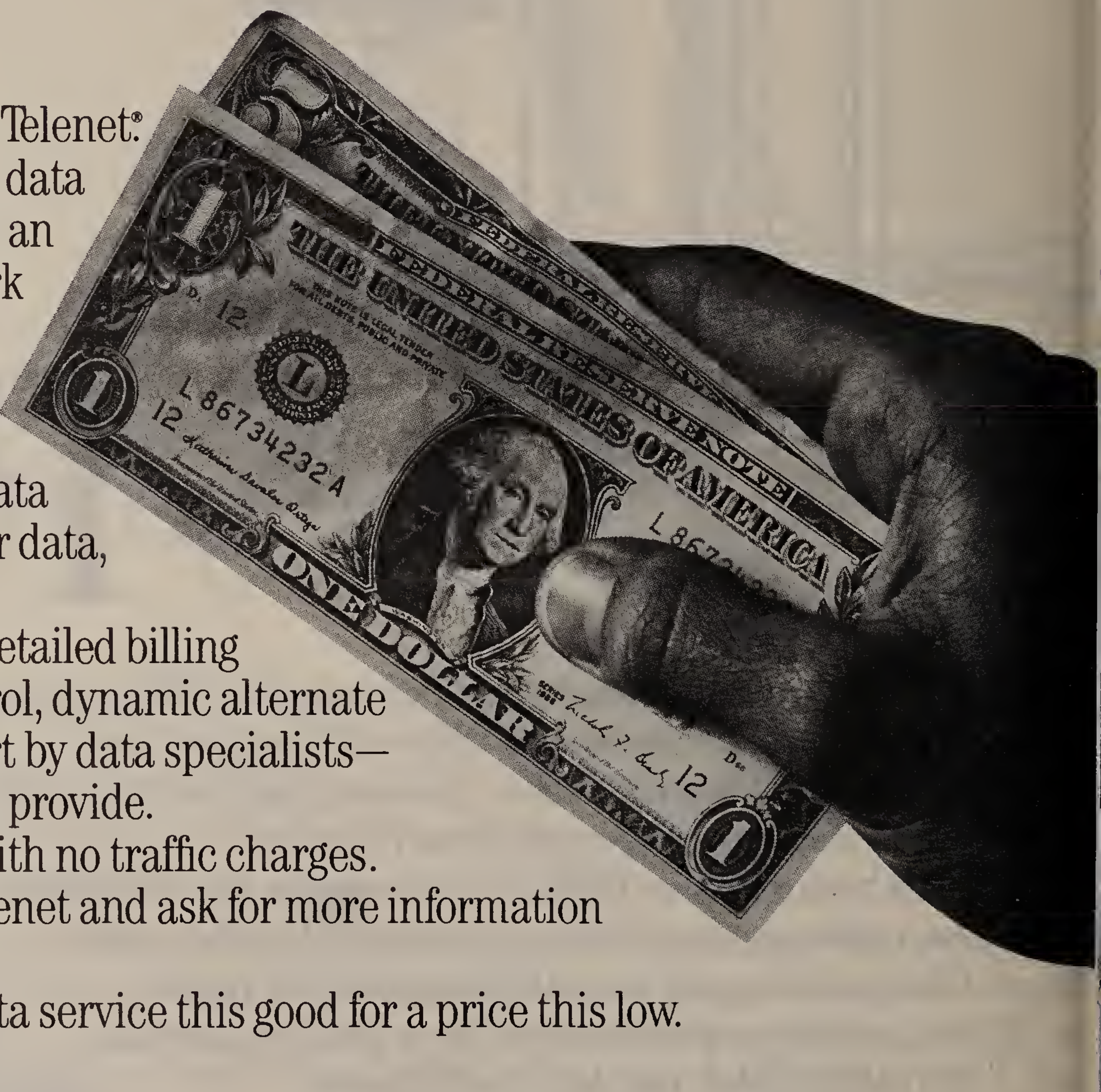

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DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

> "Both the Canadian and American governments very much want to see the [Open Software Foundation] and [Unix International, Inc.] issue settled once and for all. People are not going to want to live with two open system versions of Unix that don't work with each other."

Dan Perley
Director of
intermediate informatics
Transport Canada
Ottawa

Data Packets

Remote procedure call (RPC) specialist **Netwise, Inc.** said recently it has enhanced its RPC Tool to support several new Sun Microsystems, Inc. products as well as systems from several other vendors.

RPC Tool is a software development package used to build applications that perform cooperative processing across multivendor systems.

Netwise has just completed versions of the RPC software for Sun-3 workstations using the SunOS 4 operating system and the Transmission Control Protocol/Internet Protocol transport protocol; Sun386i workstations running SunOS 3 and TCP/IP; and Sun-4 workstations using SunOS 4 and TCP/IP.

In the personal computer environment, RPC Tool will be available later this month to support Intel Corp. 80286-based personal computers running Santa Cruz Operation's Xenix operating system and TCP/IP; microcomputers running MS-DOS and Excelan, Inc.'s TCP/IP implementation; and microcomputers running OS/2 and the Network Basic I/O System protocol. ◼

ImagePlus improved, but still under wraps

IBM broadened the operating environment of the image processing system while still in beta test.

By Paul Desmond
Senior Writer

Little more than a year after announcing its ImagePlus system, which is not yet generally available, IBM is promising to deliver more features with the image management product than it originally announced.

ImagePlus is a product worth waiting for, according to the United Services Automobile Association (USAA) and Citibank, N.A., beta-test users for the mainframe and minicomputer versions of ImagePlus, respectively. The users say the system has paid big dividends by increasing productivity and improving customer service.

ImagePlus is a hardware and software package that reduces paper documents to digitized images and provides for the storage and distribution of those images across a network ("IBM image-handling system unveiled," *NW*, July 4, 1988).

It consists of mainframe- or minicomputer-based software, image terminals based on IBM Personal System/2s, scanners from IBM or Bell & Howell Co., and optical disk or magnetic disk storage devices.

Typically, the image terminals are tied to token-ring nets, which attach to the mainframe or minicomputer. Scanners hang off the image terminals, and the storage devices are supported by the mainframe or minicomputer.

The product was announced June 28, 1988, for mainframes running MVS/ESA and for the System/36 and Application System/400 minicomputers, al-

(continued on page 18)

DATA DIALOGUE

BY JOE MOHEN

Independent LUs add pizzazz to VTAM

First in a three-part series.

IBM's Virtual Telecommunications Access Method — long considered mundane — is beginning to look like an exciting technology. Tying a minicomputer or personal computer to a VTAM host is nothing unusual. But a new technology called independent logical unit support is adding interesting new dimensions to that.

In simple terms, independent logical units allow two small computers — other than IBM mainframes — to conduct sessions over a VTAM network.

Believe it or not, until this year, two personal computers attached to the same VTAM host could not maintain sessions with each other through that host. It used to be that VTAM required one of the session partners in every session to be a host application.

Needless to say, this was a tremendous problem for many users. Suppose you had System/36s around the country that were all connected to the same VTAM network. Suppose the System/36s not only needed to communicate with the company mainframe, but also with one another.

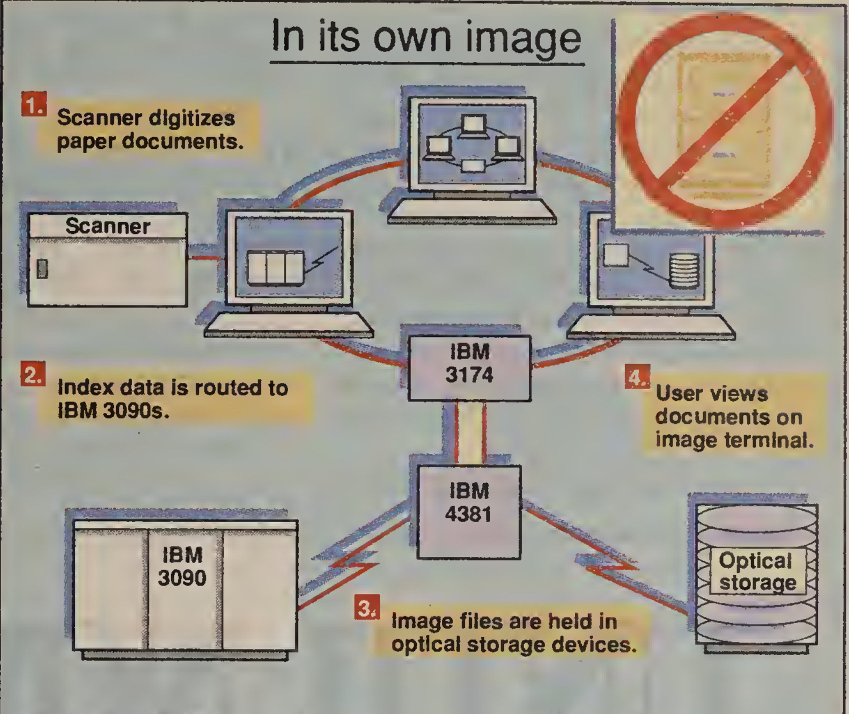
In that case, it was necessary to have redundant telephone lines linking the System/36s directly to each other.

The problem was commonly referred to as the "lack of outboard primary logical unit." IBM has finally solved it. So what is an independent logical unit and how does it solve the problem? An independent logical unit can start and stop its sessions independent of VTAM. Logical units that still require VTAM intervention are called "dependent logical units."

What criteria must be met for a logical unit to be independent?

(continued on page 18)

Mohen is an SNA specialist and consultant based in New York.


In its own image
1. Scanner digitizes paper documents.
Scanner
2. Index data is routed to IBM 3090s.
IBM 3174
4. User views documents on image terminal.
IBM 4381
IBM 3090
Optical storage
3. Image files are held in optical storage devices.

USAA uses IBM's ImagePlus to digitize roughly 25,000 pages of daily correspondence, saving the company millions each year in clerical costs.

SOURCE: UNITED SERVICES AUTOMOBILE ASSOCIATION, SAN ANTONIO, TEXAS
GRAPHIC BY SUSAN J. CHAMPENY

Beta-test user gives image mgmt. system rave review

USAA uses ImagePlus to handle digitized images.

By Paul Desmond
Senior Writer

SAN ANTONIO, Texas — United Services Automobile Association (USAA), an insurance and financial services organization based here, has the largest implementation of IBM's ImagePlus to date.

"Every time we add another user to the system, it's a world record," said Charles Plesums, director of image systems at USAA. "The next largest system I've found has 80 terminals. We currently [have] over 400 terminals."

ImagePlus, IBM's image management product, is driven by a software package on USAA's mainframe complex of three IBM 3090s and another program on a dedicated IBM 4381 mainframe.

The 3090 package, the ImagePlus Folder Application Facility, was developed by USAA and sold to IBM, Plesums said. It takes up less than 1% of the combined cycles of the two 3090 Model 600s and the 3090 Model 400, and it handles the indexing, prioritizing and routing of digitized images.

Software on the 4381 is charged with finding image documents, which may be stored on networked optical disk platters or magnetic disks, and making them available to users.

The 4381 supports optical storage devices — jukeboxes and disk drives — as well as more than 400 image terminals. The terminals are located both in the USAA home office here and at sites in Sacramento, Calif.; Tampa, Fla.; and Colorado Springs.

Local terminals are supported by some 20 IBM 4M bit/sec Token-Ring Networks. Each Token-Ring is attached to a 3174 controller, which in turn is channel-attached to the 4381.

Remote image terminals are also supported by Token-Ring Networks but tied to 3745 communication controllers that are linked to the main office by 256K bit/sec channels on T-1 lines.

USAA's image terminals are based on IBM Personal Computers outfitted with a special keyboard and display. Future versions will be based on IBM Personal System/2 Model 50s or above, according to IBM.

> "Every time we add another user to the system, it's a world record," Plesums said.

▲▲▲

Each terminal is outfitted with an adapter board that compresses and decompresses digitized images. The terminals support ImagePlus peripherals such as Bell & Howell Co. 2115 scanners.

USAA scans each of the 25,000 pages of correspondence that flow into its property and casualty policy division each day, Plesums said. Since the system is only partially implemented — USAA plans to install a total of about 1,400 terminals — only about 16% of its 2,000 service representatives have full-time access to an image terminal. The rest of the representatives share terminals. ◼

ImagePlus improved, but still under wraps

continued from page 17

though IBM did not commit to a delivery date at that time.

Instead, IBM said it simply wanted to let users know that the system was on its way, since the planning cycle for installing such a system is typically measured in years, said David Liddell, manager of marketing plans for image application systems at IBM. IBM also wanted to get additional beta tests unders its belt since the company was new to the image processing market.

This March, IBM said ImagePlus would be generally available for the System/36 on Sept. 29, for MVS/ESA on Dec. 29 and for the AS/400 by April 1990.

The company said it has improved on the original ImagePlus by broadening the operating environment in which it can be used, Liddell said. The original mainframe version at USAA only ran under IBM's IMS. For an implementation at Lincoln National Corp., an insurance company in Fort Wayne, Ind., IBM ported ImagePlus to CICS.

IBM is also working to enhance ImagePlus so it can accept image transmissions directly from facsimile machines or through optical character recognition devices. Currently, the system works only with scanners that digitize paper documents.

Likewise, IBM plans to expand the product's indexing capability so a single image can be referenced in multiple indexes.

IBM is also working on porting ImagePlus to its VM and OS/2 Extended Edition operating systems.

In the wake of its recent marketing agreement with and investment in Image Business Systems Corp. (IBS), which makes a Unix-based imaging system, IBM will develop a way to exchange files between ImagePlus and IBS' ImageSystem, Liddell said.

A plus for users

The ImagePlus systems at USAA and Lincoln National are the only mainframe versions currently in production at user sites, although a handful more are in various stages of installation, he said. In addition to Citibank, there are three other System/36 prototypes currently being tested at user sites. Liddell declined to name those users.

USAA is by far the largest ImagePlus user, with more than 400 terminals online, according to Charles Plesums, director of image systems for the San Antonio, Texas-based insurance and financial services organization (see "Beta-test user gives image mgmt. system rave review," page 17). The system is saving USAA about $5 million per year in warehouse space and file clerks, which offsets the $5 million annual cost of operating ImagePlus, Plesums said.

But it also provides intangible benefits such as backup off-site storage, better file management and improved customer service. The latter leads to improved productivity among the service representatives who use the system since they now have ready access to the documents they need to handle clients' phone calls.

"For every percent of improvement in productivity, I save a million dollars a year," Plesums said. "We've already gotten more than a percent, but we know we've hardly scratched the surface."

As far as productivity gains go, Liddell said, Citibank's 85 ImagePlus users in the company's credit card correspondence department can handle an average of 12.6 cases per hour with the system as opposed to the previous average of 10.5 cases per hour. That translates to a 20% productivity increase, he said.

Citibank would neither confirm nor deny the accuracy of those figures.

Author, author

USAA was intimately involved in the development of ImagePlus, Liddell said. It wrote and sold to IBM the software that drives the Folder Application Facility, which handles the indexing, routing and prioritizing of image files, or what IBM calls folders.

USAA also provided IBM with some additional features that have yet to be announced as part of ImagePlus, Plesums said.

One feature is used to store correspondence going from USAA to its clients. It allows the company to store information as text and then plug the text into an image of the form the correspondence was actually printed on, such as company letterhead or a policy form. That dramatically reduces the storage space required for outgoing correspondence, Plesums said.

Independent LUs add pizzazz to VTAM

continued from page 17

- The sessions it uses must be peer-oriented. In other words, they must use LU 6.2 only.
- The logical unit must reside inside a Type 2.1 device. A node that supports both LU 6.2 and also Node Type 2.1 is sometimes described as using Advanced Program-to-Program Communications. But not every APPC node supports independent logical units.

According to IBM, there are a few other requirements:

- The logical unit must be able to send a BIND command to start a session — that is, it must be primary logical unit capable, meaning it must be able to send a BIND to another device.
- It needs to support extended BINDs, which contain a special session identifier called "PCID," a procedure correlation identifier that recognizes each BIND command.
- It needs to be tested to assure it works with the latest releases of VTAM and Network Control Program.

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Worth Noting

> "Ethernet adapter prices will continue to fall. [3Com Corp. Chief Executive] Bill Krause should head for the Pacific rim to find an inexpensive PC adapter manufacturer."

Doug Gold
Communications
research manager
International Data Corp.
Framingham, Mass.

Netnotes

Networking protocol specialist **Retix, Inc.** of Santa Monica, Calif., last week said it will release software supporting the X.400 API Association's new Gateway application program interface (API) by the end of this year.

The Gateway API is designed to provide non-Open Systems Interconnection electronic mail systems with access to X.400 facilities, which in turn will enable users of dissimilar E-mail packages to communicate with one another. The product consists of a set of API libraries for Retix's existing OpenServer 400 series of X.400 message servers.

Retix may be reached at 2644 30th St., Santa Monica, Calif. 90405, or call (213) 399-2200.

The cc:Mail LAN Package for Macintosh, which enables users to exchange electronic mail between DOS-based personal computers and Apple Computer, Inc. Macintoshes, is now available from **cc:Mail, Inc.** of Palo Alto, Calif.

The product supports remote users and operates across bridges and gateways to such mainframe-based E-mail services as IBM's Professional Office System.

Priced at $495 per server, cc:Mail LAN Package for Macintosh will run across any net environment that supports Apple's Apple Filing Protocol or DOS 3.1. The company is located at 385 Sherman Ave., Palo Alto, Calif. 94306, or call (415) 321-0430. ☐

Double-duty applications

A partial listing of applications that support NETBIOS and run in Novell, Inc. NetWare and Microsoft Corp. LAN Manager environments.

Company	Product	Ship date
WordPerfect Corp.	WordPerfect V. 5.0	July 1988
Lotus Development Corp.	1-2-3 Releases 2.2, 3.0	Oct. 1989
	Symphony V. 2.1	June 1989
	Manuscript V. 2.1	June 1989
Computer Associates International, Inc.	ACCPAC Plus V. 5.1	June 1989
	SuperCalc 5 V. 1.0	Feb. 1989
Informix Software, Inc.	Informix 4GL*	Dec. 1987
	Informix SQL*	Dec. 1986
Oracle Corp.	Oracle Server for OS/2 **	Oct. 1989
	Oracle Server for NetWare 386**	Not announced
Ashton-Tate Corp.	SQL Server for LAN Manager**	April 1989

* Does not support OS/2 LAN Manager

** Indicates product is a server-based distributed application that can be shared across a LAN Manager or NetWare network.

GRAPHIC BY SUSAN J. CHAMPENY

Developers put distributed application plans on hold

Waiting for common interface, more user demand.

By Laura DiDio
Senior Editor

FRAMINGHAM, Mass. — Top software vendors say they won't develop distributed applications for OS/2 LAN Manager and NetWare 386 until network suppliers settle on common programming interfaces and user demand for such applications grows.

The result is a dearth of so-called client/server applications that allow users to take advantage of the advanced capabilities, including multitasking, of these new network operating systems.

> Software vendors say they want suppliers to standardize on the Named Pipes interface.

▲▲▲

Independent software vendors say they want network suppliers to standardize on the Named Pipes interface commonly supported in OS/2 LAN Manager environments.

Software developers say one reason they've delayed development of distributed applications for Novell, Inc.'s NetWare 386 is because that network operating system supports Novell's own interprocess communications interface.

"There is a move by Novell to provide upper level [application program interfaces]; it said it will support and provide the same APIs, such as Named Pipes, that OS/2 LAN Manager does. They have to deliver on that promise in order to survive," said David Clare, senior manager for PC products at WordPerfect Corp. in Orem, Utah.

Developers said they don't want to spend the time and money to write applications to run on each network operating system.

The availability of standard high-level APIs, software vendors said, would enable them to create distributed client/server applications that can run under multiple network operating systems.

With the current state of numerous programming interfaces, software developers say they don't expect to deliver client/server applications for at least a year or, more likely, 18 months.

"Once standards emerge for higher level APIs, the whole issue of writing applications for a specific network operating system will become a moot point," said Mark Dumont, director of product development in the Vancouver-based Financial and Microproducts Group of Computer Associates International, Inc.

"Unfortunately, we have to wait for standard APIs — such as an SQL Server API — to become available for both LAN Manager and NetWare so our applications will run in both environments. They don't exist today," Dumont added.

Two-part problem

Users meanwhile have been slow to migrate to OS/2 LAN Manager because there are still so few available client/server-based distributed applications.

The current crop of worksta-

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Airline assesses its multivendor strategy

American pits vendors against each other to get features, functionality needed for net expansion.

By Laura DiDio
Senior Editor

TULSA, Okla. — American Airlines, Inc.'s recent decision to award a contract to three vendors for 50,000 workstations for its reservation network underscores the lengths some users will go to obtain quality equipment.

Rather than award a volume purchase to any one vendor, American Airlines tapped IBM, AT&T and Tandy Corp. to initially supply it with 5,000 Intel Corp. 80386-based personal computers each.

Those devices would be used as network nodes in a major expansion of the airline's SABRE reservation net, in which American Airlines plans to install hundreds of token-ring subnetworks at travel agencies, the airline's own ticket counters and other sites over the next two years. The network workstations will also be used in InterAAct, the airline's prototype office network.

Orders for the remaining 35,000 network workstations will be awarded to the vendor that can deliver workstations with the features and functionality dictated by the airline.

It appears the airline will employ the same purchase strategy for the acquisition of token-ring interface cards for the 50,000 workstations.

At a recent meeting of the Open Token Foundation, Lindsay Miller, project manager of local network and workstation engineering at American Airlines, told a group of vendors that his company would split the order for token-ring interfaces among IBM, Proteon, Inc. and Western Digital Corp.

American Airline's multiple-source strategy flies in the face of other users who have opted to go with a single vendor in order to ensure one-stop service and support.

"We want the best of all worlds," said Bill Jewell, managing director of communications engineering at American Air-

(continued on page 20)

NCD unveils new version of its X/Windows display

By Susan Breidenbach
West Coast Bureau Chief

MOUNTAIN VIEW, Calif. — Network Computing Devices, Inc. (NCD) last week introduced a larger, more powerful version of its network display station for X/Windows and DECwindows applications on Ethernet local nets.

Start-up NCD's charter is to develop a line of intelligent X/Windows network stations that offer users the functionality of a graphics workstation at a much lower price.

NCD's net displays are a cross between a workstation and a terminal — the device handles the graphics and communications functions of networked applications but leaves the application processing to a multiuser host.

NCD's latest offering, the NCD19, boasts a 19-in. screen with 1,280 pixel-by-1,024 pixel resolution. Based on a 32-bit, 15-MHz Motorola Corp. 68020 microprocessor, it is several times faster than NCD's first product, the NCD16. It can also be configured with more memory. By contrast, the NCD16 has a 16-bit, 12-MHz 68000 microprocessor and a smaller, 16-in. screen with 1,024 pixel-by-1,024 pixel resolution.

"Basically, the NCD16 is positioned for people moving up from terminals, and the NCD19 lets people move down from workstations," said Judy Estrin, executive vice-president of NCD.

The NCD19 operates three times faster than a Sun Microsystems, Inc. Sun-3/50 diskless workstation running X/Windows, Estrin said. Moreover, it costs $3,700, compared to roughly $5,000 for the Sun-3/50.

X/Windows, a graphical user interface standard universally adopted by vendors and supported in Digital Equipment Corp.'s DECwindows, divides an application into two portions based on the client/server model.

The client in this case is the application program, which makes requests to a server (the display) for display resources. The client and server can reside on the same machine or on separate computers linked in a local network.

The NCD stations exploit this architecture by handling only the

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New bridges from Netronix handle Token-Ring routing

By Sarah Vandershaf
West Coast Correspondent

PETALUMA, Calif. — Netronix last week introduced two bridges with built-in routing intelligence that connect IBM Token-Ring Networks in complex internetworks.

Netronix unwrapped the TokenMaster 425 Subnetwork Bridge and the TokenMaster 400 Broadband Bridge, both of which use source routing technology to link Token-Ring segments.

In source routing, which IBM uses in its own Token-Ring Network offerings, software resides in the workstation. The source routing software determines the fastest route to another node on the network by sending data packets to the bridge, which transmits data over two or more alternate routes to see which packet returns first, said Terence Bentley, director of marketing. Subsequent packets are then sent over the fastest route.

The TokenMaster 425 Subnetwork Bridge can be used to partition IBM Token-Rings into subnetworks that are linked to one another over a 4M bit/sec baseband cable, allowing for complex but manageable enterprise networks, said Arthur Jopling, president of Netronix.

Data packets can pass through as many as 18 TokenMaster 425 Subnetwork Bridges between source and destination, although most networks are configured for only two or three bridge hops, Bentley said.

The TokenMaster 400 Broadband Bridge works on the same networks as the TokenMaster 425, linking subnetworks to a broadband backbone. The bridges can connect nets as far as 6.2 miles apart, Jopling said.

Both products are self-contained units that link to the wiring segments of each Token-Ring.

Netronix is marketing the bridges to large businesses, some of which now use a personal computer fitted with Token-Ring and broadband network interface cards as a bridge linking Token-Rings to the broadband backbone. Netronix estimates that buying the pieces and putting them together can cost as much as $10,000, whereas its integrated bridge costs $5,890.

Both bridges operate at the media access control layer, making them transparent to network operating system protocols. This allows the bridges to work with any network operating system compatible with the IBM Token-Ring adapter and IBM Source-Routing Protocol.

Existing software packages that can work with the Netronix bridges include Novell, Inc.'s NetWare, IBM's PC LAN Program and LAN Server, and applications such as IBM's 3270 Emulation 3.0 and Advanced Program-to-Program Communications.

The bridges are driven by a 12-MHz Intel Corp. 80286 microprocessor with an internal 16-bit bus capable of transferring data at 5M byte/sec. The bridges have built-in network management tools, including audio and visual alarms.

The two versions of TokenMaster 400 Broadband Bridge and the TokenMaster 425 Subnetwork Bridge each cost $5,890 and are available now.

Airline assesses its strategy

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line's SABRE Computer Services Division here. Jewell also wrote the procurement proposal.

Contracts for additional orders will depend on which vendor has the best performance, services, features and upgrades available at the time the airline is ready to buy the equipment, he added.

"This ensures that we have more control over what we're getting than if we bought everything at once from a single vendor," Jewell said.

Plans take flight

American Airlines' efforts to secure local network hardware that meets its own specifications is crucial to the carrier's plans to build a massive Open Systems Inteconnection backbone net that utilizes the X.400 message handling protocol. This backbone would be used to transfer messages among SABRE and InterAAct users.

The SABRE Travel Information Network reservation system will use Novell, Inc.'s NetWare 386 network operating system across the token-ring installations. No decision has yet been made on what version of NetWare InterAAct will employ.

SABRE's 4M bit/sec token-ring nets will be linked to eight IBM 3090 mainframes via various dial-up and leased-line services, ranging from 9.6K bit/sec, 56K bit/sec, T-1, fractional T-1 and T-3 services. Eventually those mainframes will be connected to a 4M bit/sec token-ring backbone net at SABRE headquarters here, Jewell said.

> "Dumb terminals connected to host systems are a thing of the past," Jewell said.
>
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The switch from a centralized host-based, dumb terminal setup to local nets will make the airline's travel reservation operations more efficient and will increase the speed of communications among the company's personnel, Jewell said.

The 80386-based workstations will replace American's current complement of dumb terminals connected to host-based systems.

"Dumb terminals connected to host systems are a thing of the past," Jewell said. "The networks will give us the flexibility of storing data locally on a file server, which will increase the users' productivity since it will decrease the time it takes to process applications."

Under the current setup, users of the airline's SABRE network have no peer-to-peer relationships. In order to make or access changes in airline arrival and departure schedules, users' dumb terminals must access the central data base located on one of the eight IBM 3090 mainframes, which are located at SABRE headquarters here. This is an outmoded and time-consuming process, Jewell said.

By contrast, the local nets will give reservation system users the ability to make updates on the file servers on the fly and see any flight schedule or arrival/departure gate changes almost instantaneously, Jewell said.

A look to the future

Similarly, the decision to put the powerful 80386 workstations at the desktop and reservation counters was made with an eye toward the future.

"As far as we're concerned the future is now. We're putting as much power, functionality and flexibility at our users' fingertips as we can. There's no sense in installing 80286-based systems now and then having to disrupt our service to upgrade to 80386s next year," Jewell said.

Developers put plans on hold

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tion applications for DOS-based nets only provide users with such things as basic file and print services and electronic mail capabilities.

Current applications aren't geared for a client/server architecture that enables workstation users, for instance, to distribute portions of data base processing to servers and host systems across a local network.

While software vendors agree they must develop sophisticated applications to take advantage of the multitasking capabilities of OS/2 LAN Manager and NetWare 386, they're still not sure that users are ready for them.

"Vendors are doing most of the talking," said WordPerfect's Clare. "Users still aren't fully aware of what advantages server- and host-based applications on OS/2 LAN Manager and NetWare 386 will give them."

Most users are happy with the applications they have now, claimed Sherry Osaka, network product manager at Informix Software, Inc. in Menlo Park, Calif. "They're still trying to figure out what SQL and relational data bases are all about, so there hasn't been a lot of demand for OS/2 LAN Manager and client/server applications."

Despite the so-far lukewarm demand, software developers say they are committed to building distributed client/server applications for OS/2 LAN Manager and NetWare 386 as soon as standard APIs are available. But none of the software shops would say how far along they are in the development process or when the products will ship.

"Application development is contingent upon high-level APIs, so we don't know when the applications will be available," Dumont said.

Similarly, Clare said, "We're going to wait for the market to mature a bit. At this point, we can't say when we'll ship applications for these products."

Carla Marcinowski, senior marketing manager for networking at Lotus Development Corp. in Cambridge, Mass., said Lotus has no specific ship dates for OS/2 LAN Manager applications.

If network vendors fail to develop standard APIs, software suppliers acknowledge that they'll build proprietary interfaces.

"We won't sit on our hands if API standards don't emerge. If that happens, we'll have to support various network vendors' APIs through our own proprietary interface," Dumont said.

That's not the best solution though, he said, since proprietary interfaces often decrease the performance of the application.

Meanwhile, the stalemate over demand vs. lack of applications continues. "Vendors shouldn't wait until users are screaming for the applications, but we at least need indicators that show they're increasing the size and scope of their LANs and need the new applications," Clare said. "And so far, very few users are telling us that."

NCD unveils new display

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display and communications functions of a networked X/Windows application, leaving the application processing to the remote host. As such, they offer the user a middle ground between low-function ASCII terminals and high-priced workstations.

Both stations run Transmission Control Protocol/Internet Protocol or optional DECnet protocols and can support multiple Unix or VAX/VMS hosts simultaneously, displaying each host session in a separate window. They come with an asynchronous RS-232 port and either a standard or thin-wire Ethernet interface.

The network interface is housed on a removable module so NCD will be able to provide existing display stations with connections to other types of media and network topologies as user needs dictate.

Estrin said the emerging 10BaseT Ethernet-over-telephone wire standard would be supported by a future NCD interface option. She listed Fiber Distributed Data Interface, Integrated Services Digital Network and IBM's Token-Ring as other likely targets.

The NDC16 and NCD19 are compatible with one another, Estrin added. Some differences between the two include the NCD16's smaller footprint, lower price ($2,500) and amount of memory supported.

The NCD19 can be configured with 2M bytes to 8M bytes of memory, while the NCD16 is limited to between 1M and 4.5M bytes. Also, the NCD19's larger screen can display two pages of text and graphics side by side, providing a high-end output device for desktop publishing applications.

> The NCD19 can be configured with 2M bytes to 8M bytes of memory.
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Estrin said the NCD19 should also appeal to workstation users who are accustomed to large displays for software development or computer-aided design and manufacturing applications. Even transaction processing users will benefit from the NCD19's high resolution and speed in their use of menus and manipulation of data, she added.

Founded in February 1988, NCD released the NCD16 one year later. The NCD19 is available 60 days after receipt of order. The company is marketing the display stations directly to users and to systems vendors for resale. NCD's current list of OEMs includes Pyramid Technology Corp., Tektronix, Inc., MIPS Computer Systems and Stellar Computer, Inc.

MANAGEMENT STRATEGIES

Worth Noting

Seventy-eight percent of the more than 500 Fortune 1,000 executives surveyed recently by the New York-based accounting firm Touche Ross & Co. said the telecommunications infrastructure in the U.S. is ''absolutely critical'' to the nation's economic prosperity.

Association Watch

The **Energy Telecommunications and Electrical Association (ENTELEC)** is now accepting abstracts of technical papers for its annual conference and exposition, to be held March 11 to 14, 1990, in San Antonio, Texas.

Technical papers can be submitted on the following topics: control systems, general and transmission systems, network technology and microprocessor technology. A 50-word abstract or a copy of the typed presentation should be mailed to ENTELEC headquarters by Sept. 21. The seven-member technical program committee will review the abstracts.

For more information, write ENTELEC '90, P.O. Box 795038, Dallas, Texas 75379, or call (214) 235-0655.

A book entitled *EDI and American Law: A Practical Guide* is scheduled for publication in September, according to the **Transportation Data Coordinating Committee:Electronic Data Interchange Association (TDCC:EDIA)**, which sponsored the book's research.

According to Benjamin Wright, the author of the book and a lawyer specializing in electronic communications law, the book is intended to help EDI users and lawyers understand each other's languages, concerns and techniques so they can develop

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Users push vendors for more usage-based pricing

Users cite current high costs, unwieldy licensing.

By Barton Crockett
Senior Editor

Frustrated by exorbitant costs and unwieldy methods of licensing software in nets, a growing number of users are demanding that vendors support usage-sensitive software payment schemes.

With usage-sensitive billing, users either pay based on how long a particular network application is used or by the number of concurrent users. Such billing methods are currently offered by only a handful of vendors. But users say more vendors need to adopt them as corporations increasingly implement network-based applications used by employees with intelligent desktop computers.

In the past, when end users worked primarily with dumb terminals linked to mainframes or minicomputers, usage-sensitive billing was largely unnecessary. Users simply licensed a single copy of a software package and ran it on the host. As personal computer use proliferated, some users employed so-called site licenses that allow them to copy software, for a stiff fee, and distribute it to individual users throughout their organizations.

But such payment schemes are quickly becoming inadequate.

''This is a big issue for users,'' said John Carson, chairman of the Software Licensing Working Group of Herndon, Va.-based Software Productivity Council (SPC), a partnership of 14 aerospace companies that have banded together to promote more efficient uses of software. ''We've got to find a better way of getting a handle on software usage in distributed networks.''

Perhaps the biggest problem with current software payment methods is that they do not take into account how software is actually used in a network. The result is that users can find themselves spending tens of thousands of dollars on software with

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EXECUTIVE BRIEFS

BY WAYNE ECKERSON

Hush, I'm working. It seems corporate America might soon catch on to an idea librarians have known for centuries: A quiet environment enhances concentration and productivity.

One company in particular, Northwestern Mutual Life Insurance Co., has made considerable noise about the virtues of silence. For starters, the Milwaukee-based insurance company has periodic ''quiet days,'' where the company unplugs its telephones so underwriters can catch up on paperwork and focus on important long-term projects.

The positive results of this practice led Northwestern Mutual's president and chief executive officer, Donald Schuenke, to commission a study on the role and value of quiet in corporate America. The result is a 40-page booklet, entitled *The Power of Quiet,* that surveys the opinions of 20 top U.S. executives and blends in the research of sociologists and psychologists.

Not suprisingly, the study found that the higher people are on the corporate ladder, the more they need time for quiet contemplation. It seems uninterrupted quiet time is essential for solving the complex problems with which top executives constantly wrestle.

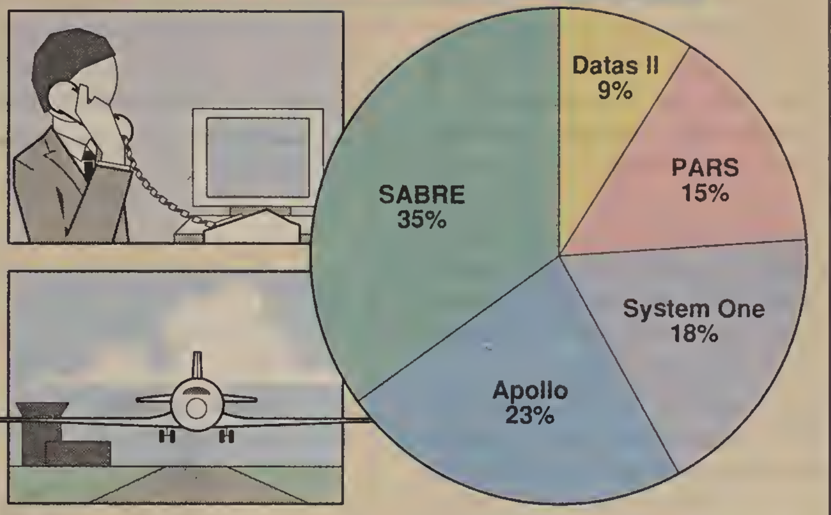
''Many [executives] use quiet to seek a condition of inner tranquility, where distractions are swept away and the mind can be focused on a point with laser-like intensity,'' the report says.

Executives who find time for quiet — whether it be alone in their office, on an airplane, walking on a beach, commuting or at home — are apt to make wiser judgments or engage in creative goal-oriented thinking, the report says. But more importantly, these executives are likely to avoid job burnout, illnesses or excessive stress levels that come from feeling ''crowded'' by people or other distractions.

According to Northwestern Mutual's Schuenke, ''The study suggests that a mature, disciplined, successful executive puts the productive use of quiet high on any list of essential attainments.''

Taking a reservation

Percentage of travel agencies that subscribe to U.S. airline reservation systems



GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: AIRLINE ECONOMICS, INC., WASHINGTON, D.C.

Competition forcing travel nets to merge

Despite failed merger of nets from Delta, American Airlines, reservation net firms seek consolidation.

By Wayne Eckerson
Staff Writer

Despite the decision by American Airlines, Inc. and Delta Airlines, Inc. to scrap a proposed merger of their computer reservation systems, observers say consolidation of reservation nets in the U.S. and abroad will continue as carriers try to improve customer service and achieve economies of scale.

Last month, the U.S. Department of Justice said it would file an antitrust suit to block the merger of American Airlines' SABRE and Delta's Datas II networks, a merger that was announced in February. Consequently, American and Delta decided to abandon the deal. The merged network would have controlled nearly 45% of the U.S. market.

> ''Connectivity is now the name of the game,'' said System One's Edward Gehrlein.
>
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Analysts said the Justice Department decision will slow consolidation among reservation net companies in the U.S. but that it will not halt the trend. Some said the decision would force small network operators such as Delta's Datas II out of business, leaving the industry with just two or three major players.

''If the small companies can't merge with the dominant players, then they will exit from the business because they can't achieve the economies of scale to compete successfully,'' said Gary Dorman, vice-president at National Economic Research Associates, Inc., an economic consulting firm based in New York.

Observers have predicted that PARS, the reservation network jointly owned by Trans World Airlines, Inc. and Northwest Airlines, Inc. will merge with System One Corp. System One is the reservation network for the new Trump Shuttle and Texas Air Corp., the parent company of Eastern Air Lines, Inc. and Continental Airlines, Inc.

Outside the U.S., foreign airlines are joining together to build major computer reservation systems, such as Gemini in Canada, Amadeus and Galileo in Europe, and Abacus in the Far East. These consortia will provide greater economies of scale and a defense against U.S. reservation network operators eager to expand into foreign markets.

The name of the game

''Connectivity is now the name of the game,'' said Edward Gehrlein, chief operating officer of Houston-based System One. ''The number and quality of computer links a [net] has to airlines, service providers and other [reservation nets] will drive future competition in this industry.''

System One has links to 40 air carriers, 30 car rental agencies, 108 hotel chains and 25 other service suppliers. In addition, System One is doing software development work for Amadeus, the European reservation net consortium backed by Air France

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Competition forces nets to merge

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and other European carriers.

"We want to develop a relationship with Amadeus so that we can be one of the first U.S. reservation nets to link into their system once they come on-line. This will extend the reach of System One significantly," Gehrlein said.

Other U.S. computer reservation networks have also made alliances with foreign consortia. Covia Partnership, whose majority owner is United Air Lines, Inc., is providing systems support and software to Gemini and Galileo. Covia owns one-third of Gemini, and United Air Lines has a minority interest in Galileo.

These overseas alliances help U.S. reservation net operators circumvent restrictive European laws against formation of reservation net companies owned by one airline. The laws are intended to avert anticompetitive bias in the reporting of competing airlines' fares and flights.

In addition, the alliances will help U.S. operators make more efficient use of their computer systems during off-peak hours. Because of the difference in time zones, U.S.-based computer reservation systems will be able to handle many additional customers without adding extra capacity.

"Computer reservation systems have a tremendous need to increase economies of scale and provide detailed information about passengers and flights," said Dan Kasper, director of the transportation practice at Harbridge House, a management consulting firm in Boston. "As a result, we are moving to fewer systems," more of which will be jointly owned.

Flights and flowers

Each travel agent, hotel or car rental agency that subscribes to a reservation network reduces the overhead of running the system. Reservation net companies that can attract the most subscribers will operate more profitably than competitors, Kasper said.

In addition, as a reservation network establishes more links to airlines and other service providers, it enables travel agents to offer clients a wide range of travel services, from booking hotel rooms and renting cars to purchasing theater tickets and flowers, according to industry sources. This makes the net more attractive to travel agents and increases its subscriber base.

To provide the kind of diverse information that subscribers are beginning to demand, reservation net operators are enhancing the quality of their links to airlines and other service providers.

System One, for example, has a capability it calls Direct Access that allows subscribing travel agents anywhere in the world to access information with the same ease and speed as if they were at the airline's ticket counter. This enables travel agents, for example, to check seating availability minutes before a plane departs.

Direct Access is also providing subscribers with detailed on-line information about passengers, such as their native language, food preferences, frequent flier status and whether they need wheelchair service. Previously, this type of flight information was transmitted to a reservation network in batch files at night. Now System One subscribers can retrieve this information from anywhere in the world in two to four seconds, according to System One's Gehrlein.

"The [reservation system] that can provide this kind of information will be in business for a long time," he said. "What we are doing is turning the world into a very small place." ◼

Users push for usage pricing

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few, if any, hard figures to justify the investment.

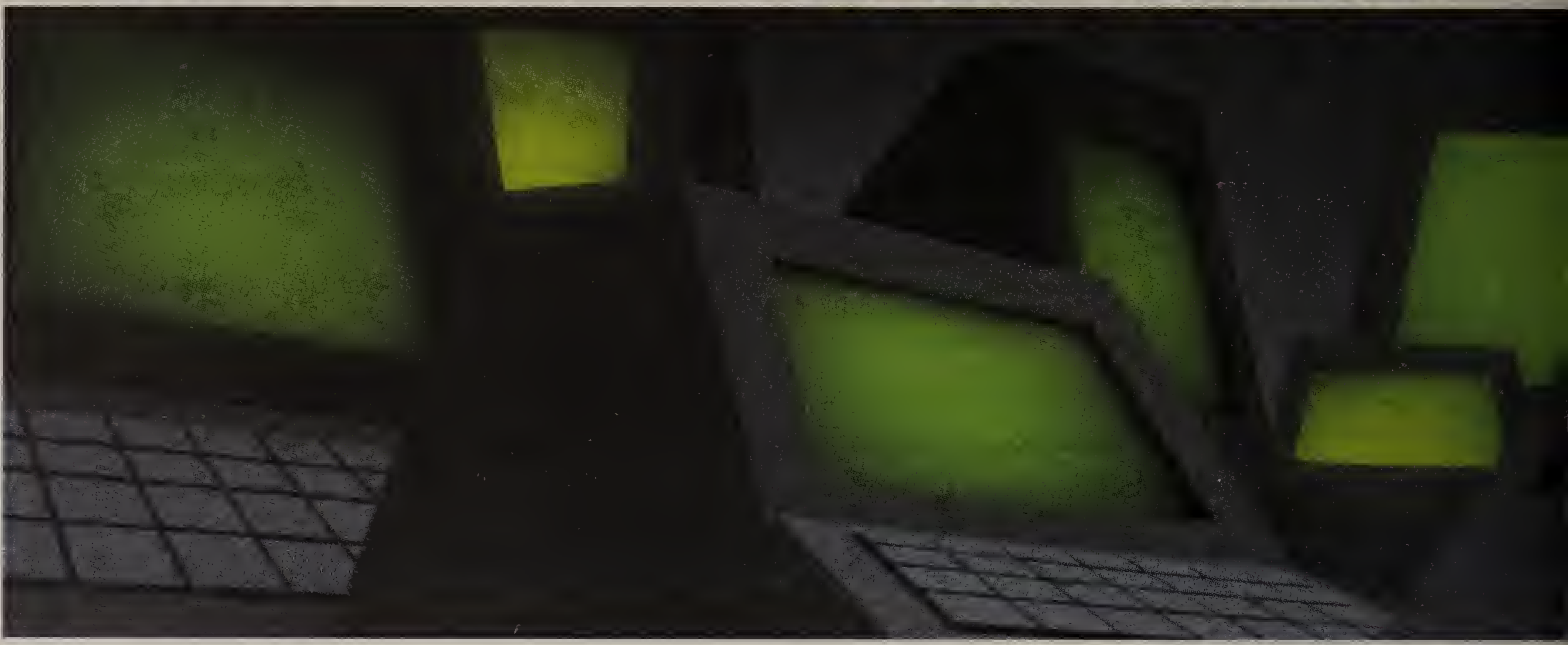
"We spend upwards of $190,000 per workstation on software and only $20,000 on hardware," said one assistant program manager in charge of distributed computer automated design networks at a Midwest-based aviation company who requested anonymity.

"We've got to have a better way to justify this investment to upper management," he said.

Usage-sensitive billing plans address this problem by recording how often software in a network is used.

How this can be done is shown by the Network License Server (NLS), a usage-sensitive billing tool unveiled two years ago by

Towers of babble.



What we have here, communicators, is a failure to communicate.

An electronic cacophony of disparate subnetworks—PBX's, LAN's, T1's. All working. Each with its own language and agenda.

To handle this information management nightmare, scientists at our NYNEX Science & Technology Center are developing the software system of the future.

Manager of Managers.

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This is only one of our insights into emerging information technologies. For now-minded futurists, a state-of-the-art NYNEX network management solution can answer needs like call accounting, bill verification and configuration management, as well as network planning and design.

the Chelmsford, Mass.-based Apollo Division of Hewlett-Packard Co.

NLS limits the number of concurrent users of applications on a network by maintaining a set number of licenses on a processor dedicated as a license server. When a user loads an application, the application queries the license server for an available license. Unless one is available, the user will be denied access.

Billing is based on the number of licenses a user buys from the software vendor. The license server keeps a record of software requests, and users can utilize this record to figure out how many licenses to buy. Software vendors must rig their applications to work with NLS.

Other firms such as Los Angeles-based MacNeal-Schwendler Corp. have devised ways to put meters inside their applications that actually measure how much time a computer spends running the firm's software products. These measurements can then be used to bill the user.

Cutting investments

In addition to helping users get a better handle on how popular different software is in their company, usage-sensitive billing can help cut expenditures.

"Without usage-sensitive billing, users find themselves buying more software than they need just to make sure they have enough," SPC's Carson said.

A New York-based consortium of investment firms, the Financial Information Standards Organization (FISO), is so enthusiastic about usage-sensitive billing that earlier this year it published a model describing how usage-sensitive billing could be applied to on-line market data services. FISO cited Apollo's NLS as an example of how access to market data could easily be limited within a brokerage firm. Brokerage firms could also use NLS to monitor which data feeds are used most frequently and which ones are neglected.

In part by eliminating subscriptions to unpopular market data feeds, NLS could help brokerage firms cut their market data expenditures as much as 30%, according to David Isherwood, an assistant vice-president at the New York-based brokerage house Shearson Lehman Hutton, Inc. ("Brokerages wrestle with growing market data costs," *NW,* July 10).

Despite widespread demand for usage-sensitive billing, only about a half dozen software vendors currently support the technology, Carson said.

"When it comes to things like this that radically change the way vendors make their money, most are slow to jump on board," he said.

That may change in the near future as, for example, more vendors begin to incorporate Apollo's NLS. To date, 30 software vendors have licensed versions of NLS and plan to integrate it with their applications, according to Herrick Johnson, manager of network systems products at the computer maker. Herrick declined to name the vendors but said that several plan to announce products that support NLS in the next few weeks.

Many users said greater support for usage-sensitive billing is inevitable. Software vendors will increasingly realize that usage-sensitive billing does not have to be threat to their revenue, they said. In fact, usage-sensitive billing could be a boon, since users might actually spend more if they were armed with better knowledge about what they get for their money.

"It's not that I'll necessarily spend less," said one systems programmer at a major West Coast aerospace company. "It's just that I want to have a better feel for what I'm spending [my money] on." ◼

Association Watch

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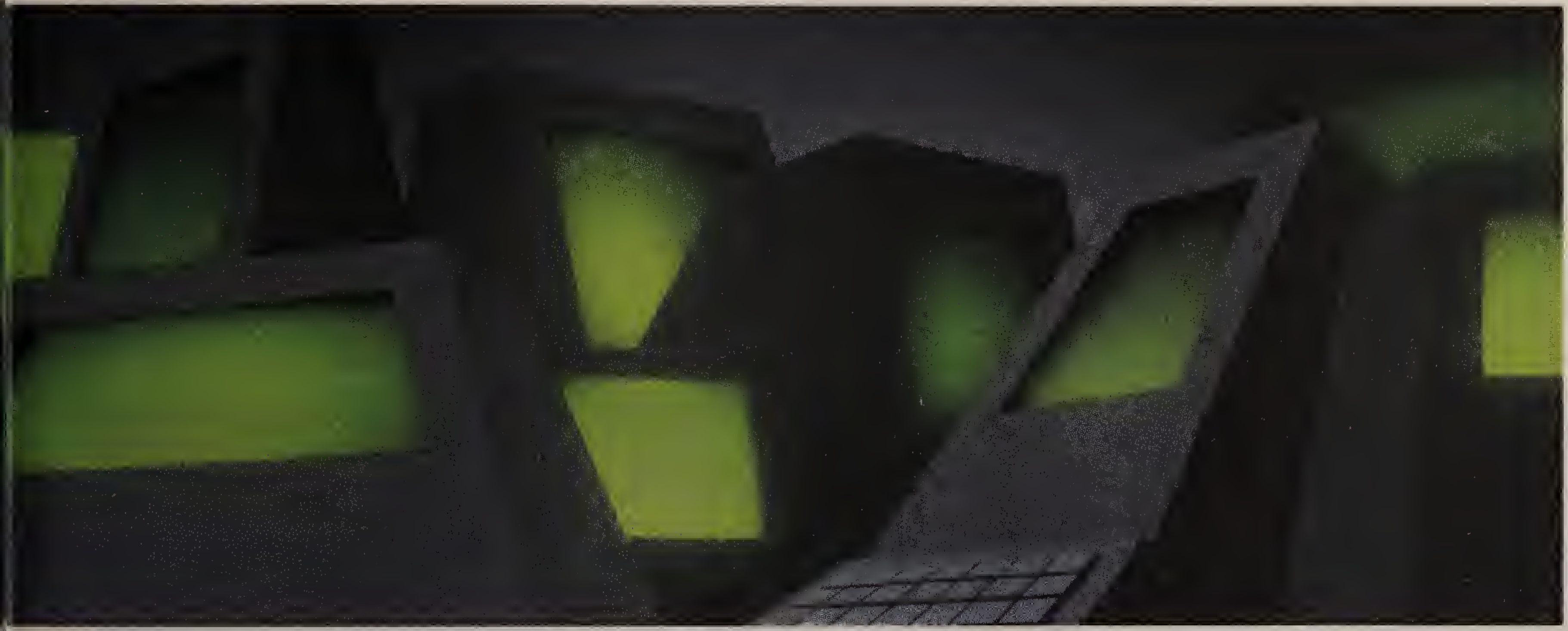
workable solutions to legal issues surrounding use of EDI.

The 140-page book covers topics such as: trading partner agreements, electronic funds transfers, the enforceability of an electronic contract, how EDI messages should be recorded in order to be admissible as evidence in a courtroom and EDI antitrust concerns.

TDCC:EDIA is offering the book at a prepublication price of $49.95. The retail price will be $69.95. To order the book at the discount price, call TDCC:EDIA's subscriptions department at (703) 838-8042. ◼



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PRODUCTS & SERVICES

THE LATEST OFFERINGS FROM VENDORS AND CARRIERS

Worth Noting

Next week:
A *Network World* data communications Buyer's Guide will provide you with the pluses and minuses of the latest high-end statistical multiplexers and time-division multiplexers.

First Look

SMC enhances Arcnet adapter

Standard Microsystems Corp. (SMC) has enhanced its top-of-the-line Arcnet adapter for Arcnet local networks and introduced a half-slot version of that board.

SMC is also offering a special driver with both boards that doubles network throughput. Both adapters have diagnostic LEDs visible from outside the host computer and externally located node identification switches for making network modifications.

The SMC **PC130E** full-size board, which supports coaxial cable, has a jumper switch that lets the installer choose between a star or bus topology. The half-slot **PC270E,** which is used with unshielded twisted-pair cable, has two modular jacks that enable it to be used in both star and daisy-chain topologies.

The boards are priced at $295 each. SMC's existing PC130, which has not been discontinued, now costs $245.

Standard Microsystems Corp., 35 Marcus Blvd., Hauppauge, N.Y. 11788; (516) 273-3100.

LAN troubleshooting service debuts

Spacemark Associates, Ltd. recently launched **LAN-Aide,** a New England-area service through which the company will tune and troubleshoot local networks.

Company personnel evalu-

(continued on page 27)

Nuvotech introduces smart hub

By Susan Breidenbach
West Coast Bureau Chief

SAUSALITO, Calif. — Nuvotech, Inc. next month will begin shipping an intelligent hub for networking Macintosh computers over telephone cable.

The company, based here, says TurboStar will be the first active hub device to operate as a standard AppleTalk device and support unshielded twisted-pair wire.

TurboStar will compete with Farallon Computing's 2-year-old Star Controller, a passive hub, which has the market to itself.

The Nuvotech active star network hub supports 16 branches. An administrator with the appropriate password can control it from any node. Based on a Motorola Corp. 68000 microprocessor, it features automatic network configuration, network management tools and diagnostics.

Network configuration data is maintained in nonvolatile memory, so the network does not have to be reconfigured in the event of a power outage.

TurboStar identifies errors that can jam a network and automatically disconnects a branch that experiences a failure before it can affect the rest of the network. The network management software lets the administrator configure the network and monitor it at the network, port and user levels.

A graphic display depicting network activity indicates how busy each device on the network is and what the network load factor is. Statistics about the load on the network take into account packet size, not just the total number of packets per second. Network software provides a 110-character scratch pad for each port, which the network administrator can use to record irregularities or make other notations.

> Statistics about the net take into account packet size, not just number of packets per second.
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George Arabian, vice-president of marketing and sales for Nuvotech, said it is already being shipped to selected beta-test sites, including Martin Marietta Corp., Honeywell Bull, Inc., Boeing Computer Services Co. and Chevron Corp. TurboStar is priced at $1,795 and is scheduled for release on Aug. 5.

Nuvotech's current product line comprises TurboNet and TurboNet ST — two AppleTalk-to-twisted-pair adapters — as well as an AppleTalk-to-AppleTalk

(continued on page 26)

NEC modem has separate channel for diagnostics

By Tom Smith
New Products Editor

SAN JOSE, Calif. — NEC America, Inc. recently unveiled a 19.2K bit/sec diagnostic modem that supports communications and diagnostic functions on separate channels.

The SPN 19275M modem also provides multiplexing and data branching functions that reduce costs by decreasing the number of leased lines and front-end processor ports needed to support communications.

The 19275M is compatible with other NEC America SPN modems as well as the NEC America Network Control and Management System (NCMS)/PC 386.

The modem's monitoring channel operates at 75 bit/sec and is independent of the 19.2K bit/sec primary communications channel. Many diagnostic modems support diagnostic functions over the main data channel, according to Chris Kieff, product marketing specialist in NEC America's Data and Video Communications Systems Division.

"The problem with that is if the circuit degrades and can no longer pass the main channel data, you've lost control," Kieff said. "Your diagnostics are gone with it."

Diagnostic and control features of the NEC America four-wire, full-duplex modem include internal dial backup, automatic speed fallback and fall forward, which occurs when line quality is restored.

The user sets threshold performance parameters either on the modem's front-panel LED display or through the NCMS/PC 386 net management system, according to Kieff. In the event that problems occur, such as an increased signal-to-noise ratio or if a threshold is passed, alarm in-

(continued on page 27)

Speech recognition system makes debut

Scott Instruments' PC-based system recognizes up to 160 words, regardless of the speaker.

By Tom Smith
New Products Editor

DENTON, Texas — Scott Instruments Corp. recently announced a personal computer-based speech recognition system that can recognize up to 160 words from any speaker.

The SIR Model 20 speech recognition system can be used stand-alone, allowing a user to enter and call up information from a personal computer by voice commands, or it can be accessed by a telephone.

The system consists of a board for IBM Personal Computer XTs, ATs or compatibles, Speech Communication Manager (SCM) software for creation and editing of the vocabulary, and a software component utilizing Scott Instruments' Coretechs speech recognition technology.

One stand-alone application for the SIR Model 20 could be to use it as an additional input mechanism for things such as sophisticated engineering applications, said Bruce Balentine, applications analyst for Scott Instruments. It provides a new I/O channel, letting a user call up data faster without being distracted from eye/hand activity.

In these types of applications, the user will benefit from the system's ability to process phrases of up to four seconds in length as one word, Balentine said.

A computer-aided design and manufacturing application, for example, could use this feature with phrases such as "query data base" or "rotate image."

The telephone version of SIR Model 20 requires that the personal computer be outfitted with a telephone line interface.

(continued on page 26)

MagicSoft pack provides MNP functions to modems

LOMBARD, Ill. — MagicSoft, Inc. recently introduced software that adds Microcom, Inc.'s Microcom Network Protocol (MNP) error correcton and data compression to any Hayes Microcomputer Products, Inc.-compatible modem.

MTE 2.1 software supports MNP Levels 2, 4 and 5, according to Donovan Kuhn, president of MagicSoft. MNP Levels 2 and 4 provide 100% error-free asynchronous communications, while MNP Level 5 can compress data by up to 50%.

The software supports full-duplex data rates up to 19.2K bit/sec, Kuhn said, as well as any modulation technique.

MTE 2.1 is also compatible with modems that adhere to the new CCITT V.42 international standard, which uses the Link Access Procedure M error-correction protocol.

The program features Lotus Development Corp.'s Lotus 1-2-3-style menus, as well as a dialing directory with a 200-entry capacity and an automatic logon function for connection to public data networks.

MTE 2.1 add-ons with more advanced functionality are offered separately. Add-ons support ZModem, BPlus and Kermit file-transfer protocols. ZModem was developed for the public domain. BPlus is the recommended protocol for users on CompuServe, Inc.'s Information Service. Kermit, developed by Columbia University, is typically found on Unix systems.

Add-ons also have terminal-emulation capabilities for the IBM 3270; Wang Laboratories, Inc. VS; TeleVideo Systems, Inc. Model 912, Model 920, TVI-912/TVI-920 Series and Model 925; and Wyse Technology WY-50. They also feature a full-screen text editor and a keyboard map editor.

Terminal-emulation capabilities that come standard with MTE 2.1 are for the Digital Equipment Corp. VT-102 and teletypewriter terminals.

Modem manufacturers Intel Corp. and Touchbase Systems, Inc. have bundling agreements with MagicSoft whereby they supply MTE 2.1 with their non-MNP modems, MagicSoft said.

MTE 2.1 runs on any IBM Personal Computer or compatible and is available immediately. It is priced at $79.

Add-ons cost $19 and are also available now.

MagicSoft can be reached by writing to P.O. Box 396, Lombard, Ill. 60148, or by calling (312) 953-2374.

Speech recognition system debuts

continued from page 25

For that purpose, the company will license other manufacturers' generic interface boards. This system could be utilized by banks for applications such as providing customers with checking account balances by phone.

Tailored vocabularies

SIR Model 20 enables users to create vocabularies tailored to their needs, according to George Kempston, vice-president of marketing for Scott Instruments.

It also simplifies the process of taking the numerous voice samples required for accurate recognition and for adapting the vocabulary.

In order to place a given word in a template for recognition, users type in the word and then enter a number of voice samples via microphone. The system's digital record, edit and playback capabilities are used to test and hone the quality of recognition.

The company claims 95% accuracy on first-time recognition with any voice. Testing procedures are used to correct the 5% of inaccurate recognitions.

Testing and fine-tuning of the system's speech recognition capabilities are performed by comparing a speaker's words with those on templates.

Though the Scott personal computer board has a 160-word limit, more words can be stored on the personal computer's memory and accessed as needed, Kempston said.

"Our general experience has been that large numbers of words are more of a bother than they are an advantage in an isolated word recognizer," Balentine said.

The system can recognize within 95 msec 40 words chosen by the user as active, Balentine said. Active words are a subset of the vocabulary that are appropriate to the application. Designating more words as active would increase response time.

A Microsoft Corp. C Version application program interface (API) is designed for C language users to develop speech recognition applications. It requires 20K bytes of the personal computer's memory.

A second API is provided for users working in a language other than C to tailor applications to their needs. The second API is a memory-resident interface that uses standard DOS software interrupts for speech I/O. It uses 64K bytes of the computer's memory.

A keyboard input simulation feature enables the user to run an application through any combination of speech or keyboard entry. Its primary purpose is to allow end users who want to use off-the-shelf applications to drive them with speech, according to Balentine.

Pricing

The SIR Model 20 development system for the personal computer, including board, software and microphone, is available immediately for $2,495. An application version consisting only of the board and microphone is priced at $1,495 and is also available now. The telephone versions will be available by the end of 1989.

Scott Instruments can be reached by writing to 1111 Willow Springs Drive, Denton, Texas 76205, or by calling (817) 387-9514. ◪

Nuvotech intros smart hub

continued from page 25

bridge. TurboNet ST, priced at $59.95, is a self-terminating adapter with LED status indicators that has been getting high marks from users.

TurboBridge, which lets large AppleTalk networks be subdivided into logical work groups, lists for $449. It comes with two built-in TurboNet ST connectors and can be used to create passive-star configurations. The bridge, which has a Motorola 68008 microprocessor, can restrict access to certain segments of an internetwork. TurboBridge can also be configured as a repeater.

Nuvotech's entire product line is currently based on LocalTalk, but Arabian said the company will begin introducing Ethernet versions of its Macintosh networking products later this year.

Nuvotech is located at 2015 Bridgeway, Suite 204, Sausalito, Calif. 94965, or call (415) 331-7815. ◪

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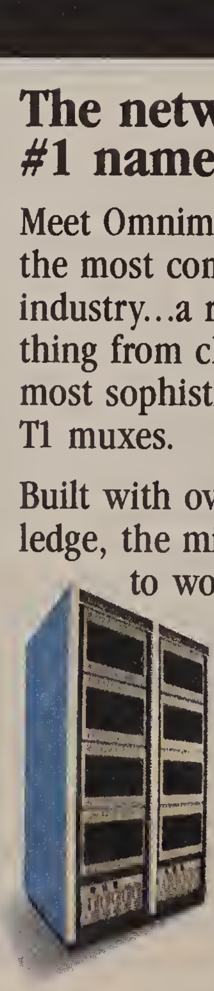

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Want more? How about bandwidth contention. Bypass, automatic alternate routing, and drop/insert. Versatile data and voice support. And still more. All at a price you're sure to like.

NEC modem has separate channel

continued from page 25

formation appears on the front panel.

To compensate for line impairments, the modem will automatically fall back to one of the following user-definable speeds: 16.8K, 14.4K, 12K or 9.6K bit/sec. The modem will return to its original speed once line conditions improve.

If the modem speed degrades to the minimum speed that the user has set, the modem will initiate the dial backup function, Kieff explained. Once communications is established between local and remote modems, transmission will shift from the leased to the dial-up line.

The modem then checks the leased line periodically, with the user determining the number of successful checks needed before the modem returns to the leased line.

Multiplexing functions

The SPN 19275M synchronous modem has six ports, enabling the user to employ it as a time-division multiplexer that eliminates leased lines by supporting as many as six channels over a single line.

"Since the largest cost of operating a leased-line network is the recurring monthly cost of phone lines, eliminating unnecessary leased lines represents a considerable savings," Kieff said.

Data branching allows six modems to share, through the SPN 19275M, a port on a front-end processor as well as to distribute data to multiple remote devices. This eliminates the need for and cost of a port- or modem-sharing device.

The NEC modem uses trellis-coded modulation error correction.

The product, available now, is priced at $7,495.

NEC America's Data and Video Communications Systems Division can be reached by writing to 110 Rio Robles, San Jose, Calif. 95134, or by calling (408) 433-1250. ☐

First Look

continued from page 25

ate customer networks and provide complete written performance reports including statistics such as activity by node and total network activity by frames per second.

A baseline performance report gives users a standard against which they can measure the impact of potential changes on the network.

The company uses popular diagnostic tools such as the Network General Corp. Sniffer local net analyzer. The service is targeted at users that are expanding their net as well as those experiencing degraded performance or intermittent delays in response time.

The custom reports outline problem areas that require further investigation. Spacemark Associates will suggest ways to correct problems based on that information.

The LAN-Aide service is available now. It costs $995, which includes off-site report generation, expenses and travel, and up to four hours of on-site analysis.

Spacemark Associates, Ltd., 2 Dexter St., Cumberland, R.I. 02864; (401) 723-3282.

Store-and-forward fax service debuts

The Pan Network recently announced a store-and-forward facsimile service that enables subscribers to receive faxes when they are away from the office.

With **FaxMail,** subscribers are assigned a dedicated fax number for incoming documents. The documents are stored until the subscriber calls in and specifies where the fax message should be sent.

Subscribers can have faxes retransmitted to a fax machine or they can be sent to a personal computer in the form of an electronic mail message. In addition, subscribers can have Pan Network page or call them when they receive a fax. FaxMail is designed for professionals who travel frequently.

Monthly charges for the service range from $15 to $62.50, according to volume plus usage charges. There are discounts for heavy-volume users.

The Pan Network, P.O. Box 162, Skippack, Pa. 19474; (215) 584-0300. ☐

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*Datapro, *User Ratings of Network Management Systems*, September, 1988.

**International Data Corporation (IDC), *Quantitative Analysis of the Network Management Market*, October, 1988.

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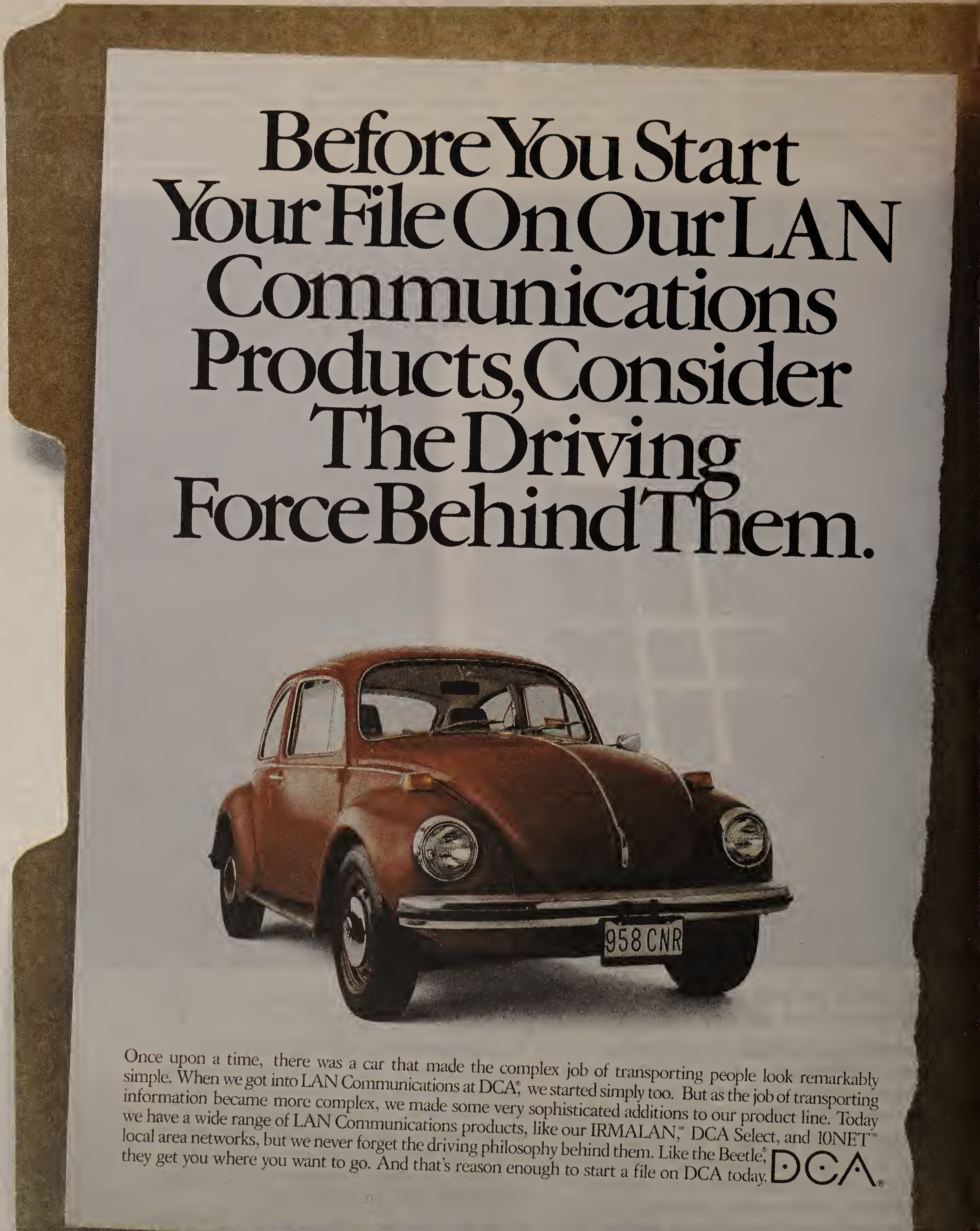

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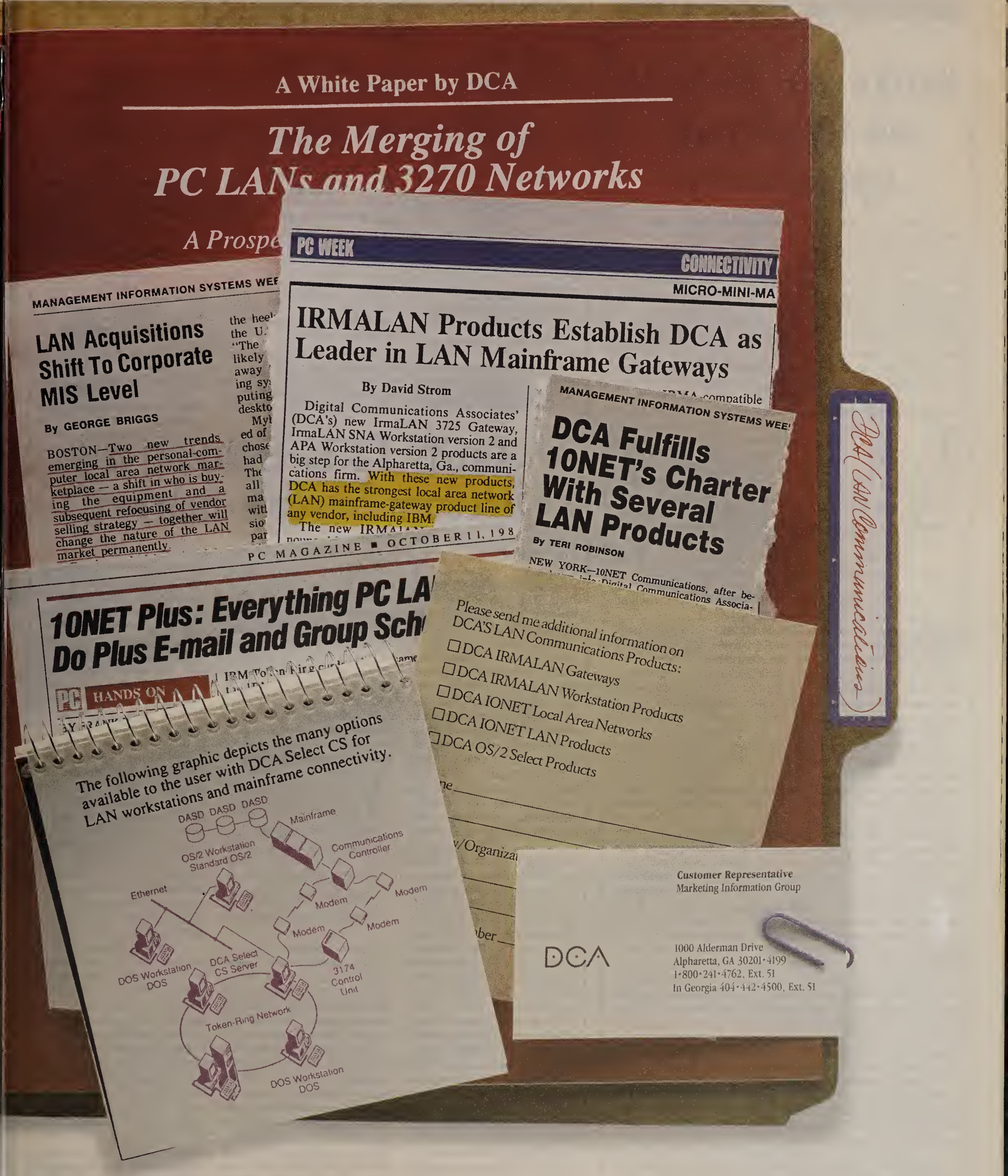

A White Paper by DCA

The Merging of PC LANs and 3270 Networks

A Prospe

MANAGEMENT INFORMATION SYSTEMS WEE

LAN Acquisitions Shift To Corporate MIS Level

By GEORGE BRIGGS

BOSTON—Two new trends emerging in the personal-computer local area network marketplace — a shift in who is buying the equipment and a subsequent refocusing of vendor selling strategy — together will change the nature of the LAN market permanently.

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PC WEEK

CONNECTIVITY

MICRO-MINI-MA

IRMALAN Products Establish DCA as Leader in LAN Mainframe Gateways

By David Strom

Digital Communications Associates' (DCA's) new IrmaLAN 3725 Gateway, IrmaLAN SNA Workstation version 2 and APA Workstation version 2 products are a big step for the Alpharetta, Ga., communications firm. With these new products, DCA has the strongest local area network (LAN) mainframe-gateway product line of any vendor, including IBM.

The new IRMA

IRMA-compatible

PC MAGAZINE ■ OCTOBER 11, 198

MANAGEMENT INFORMATION SYSTEMS WEE

DCA Fulfills 10NET's Charter With Several LAN Products

By TERI ROBINSON

NEW YORK—10NET Communications, after be- ... Digital Communications Associa-

10NET Plus: Everything PC LA Do Plus E-mail and Group Sch

PC HANDS ON

IBM Token Ring

The following graphic depicts the many options available to the user with DCA Select CS for LAN workstations and mainframe connectivity.

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OPINIONS

EDI

BY VIC WHEATMAN

Banks are blowing an important opportunity

In a flurry of recent announcements, major banks are addressing their electronic data interchange opportunities in payment services and more broadly in electronic trade transactions. Security Pacific National Bank, Harris Bankcorp, Inc., Wells Fargo & Co. and several others have entered the fray, competing against one another and, in some cases, competing against the existing network service providers such as GE Information Services or ORDERNET Services, Inc. for "pure EDI" — EDI transactions that may not be married to electronic funds transfer transactions.

However, the banking industry is blowing it by flooding the market with a confusing plethora of competing services and a steady stream of press releases and service announcements. First of all, some banks are regional. Although bank officials may disagree, the First National Bank of Chicago may have trouble selling EDI services in California. Even if that were not the case, support issues basically limit any bank's market, geographically or by industry. Second, by competing among themselves, banks are splitting up the EDI market in such a way that it is unlikely any of them will be profitable.

The banking industry is flooding the market with a confusing plethora of services.

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What's needed is an industrywide solution — not one bank competing against the others, but the banking industry as a single entity competing against the alternatives. This plan has a certain beauty. According to a recent Gallup Poll, Americans trust banks implicitly. With customer permission, banks providing loans or buying accounts receivables, called factoring, could use the data traversing an EDI service for loan evaluation and to verify liquidity.

The National Automated Clearinghouse Association is looking at the options. And the American Banking Association has been studying EDI in relationship to payment services. There has been talk about an industrywide approach. After all, the Association of American Railroads established RailInc, which provides EDI services in transportation and other industries. The Motor Equipment Manufacturers Association has TransNet for automotive and appliance parts. Other examples exist. Why not an EDI service from the banking industry as a whole?

This EDI service could be sold and supported by individual banking institutions. It could use an existing banking network, assuming capacity and security questions are addressed. If the major banks could get it together, they could achieve market share by buying one of the existing EDI nets, such as GE Information Services' EDI*Express. If each bank kicked in a little cash, they'd have the down payment in no time.

But if they don't want to go that route, the banks could find an alternative network or networks. Several of the regional Bell holding companies are looking at EDI — although as of this date, their involvements have been rather furtive. In a carefully crafted partnership, the banking industry and the telecommunications industry would make a formidable combination, one that could give the existing EDI services cause to pause.

With all the initiatives announced recently, this hot subject is unlikely to go away soon. For users seeking clarity in a rapidly growing market characterized by endless choices, having one choice for both purchasing-related EDI and financial transaction-related EDI would certainly make life a little easier.

Wheatman is manager of the EDI program at Input in Mountain View, Calif., and editor of the "EDI Reporter" newsletter.

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EDITORIAL

Tariff 12 is creating a telecom buyer's market

In sports, it's often said the best defense is an aggressive offense. AT&T must have had this axiom in mind when it devised its Tariff 12 game plan.

The carrier's most recent Tariff 12 deals indicate that AT&T is using the custom tariff as an offensive tactic instead of as a defensive countermeasure to stave off account encroachments by MCI Communications Corp. and US Sprint Communications Co. That's not to imply that AT&T is using Tariff 12 to institute predatory pricing against its rivals. AT&T is on the offensive because it is enlarging the scope of companies to which it's willing to offer Tariff 12 deals and is becoming increasingly flexible so it can keep rivals from stealing its customers.

"I've never seen AT&T with such a killer instinct," says Bill Rush, vice-president of information systems at The Prudential Insurance Co. of America, which signed with AT&T for a five-year, $25 million Tariff 12 deal two weeks ago.

On June 30, for instance, AT&T signed on Combustion Engineering, Inc. and First Chicago Corp. as two of its smallest Tariff 12 customers. Those filings suggest AT&T is expanding the purpose of Tariff 12, from an exclusive mechanism to keep large users in the fold to a general discount tactic for any customer — regardless of the revenue generated by the deal.

Rival carriers will no doubt cry foul over AT&T's broadening use of Tariff 12. The Federal Communications Commission may or may not find AT&T guilty of predatory pricing at some later date — but that's not the issue for telecommunications managers today.

The real issue is that AT&T's liberal use of Tariff 12 is bound to make the market more competitive, thus creating favorable buying conditions.

AT&T's liberal use of Tariff 12 is bound to make the market more competitive, thus creating favorable buying conditions.

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Users should be able to pry special terms and conditions, not only away from AT&T, but also from MCI and US Sprint.

AT&T, of late, has shown it is willing to play ball and bow to customer demands. For example, AT&T's deal with Prudential has provisions that enable the insurance giant to renegotiate rates should prices plummet.

In a recent Tariff 12 signing with General Electric Co., AT&T also agreed to build the user an international network. Interestingly enough, AT&T assured GE that the network would be accessible through rival carriers' nets, as well as AT&T's own network.

This means AT&T is hungry and willing to do whatever it can to keep customers in the fold.

MCI and US Sprint should be more flexible too. Network managers should leverage this situation now by dictating their own terms to any of the Big Three carriers.

Who's to say how long this buyer's market will last? Or how the newly staffed FCC will interpret future tariff issues? The time to negotiate new services and network upgrades is now.

While price may not always be a crucial factor in a company's decision-making process, telecommunications managers can now demand — and apparently get — better uptime guarantees, improved performance clauses and heartier discounts.

In today's competitive market, users can probably get any of the carriers' account representatives to agree to build links between their own public data nets and services offered by rival carriers. That way, the user gets a custom link without paying through the nose and the carrier's representative retains account control over the competition.

Telecommunications managers should be thinking about how to get the best possible deal. Not only that, but they should ask for everything. In this buyer's market, how can a carrier say no?

OPINIONS

TARIFFS

BY ALAN PEARCE

Congressional input valuable in telecom policy-setting

It is wrong, perhaps even reckless and irresponsible, to suggest that the U.S. Congress should not be taken seriously in its current attempt to shape the telecommunications and information marketplace through legislation ("Fighting all odds, Congress takes another stab at telecom," *NW*, May 8).

Even though legislation may not pass during this session, Congress has a profound influence on public policy. Congressional authority is exercised via hearings, reports, letters, speeches, telephone calls, the confirmation of presidential appointees and even the floating of legislative proposals that might never be enacted.

Congress wisely and expertly uses all of these processes to assert control. Congress influences the presidential appointees who run the Federal Communications Commission, the National Telecommunications and Information Administration, the Department of Commerce, the Department of Defense and federal judges, such as U.S. District Court Judge Harold Greene, who oversees the Modified Final Judgment.

It is also irresponsible to pour scorn on congressional legislative initiatives. To suggest that failure is inevitable for the legislative package designed to relieve the seven regional Bell holding companies of the information services and manufacturing prohibitions in the Modified Final Judgment is tantamount to telling interested parties not to take the democratic process too seriously.

To state that Congress does not have the incentive, knowledge or wherewithal to achieve reform simply because it has previously failed to pass legislation ignores the following:

- Congress did have an influence on the structuring of the Modified Final Judgment between 1982 and 1984. The RBHCs were given the go-ahead to provide cellular telephone service and Yellow Pages, and to distribute customer premises equipment — in part, at the urging of Congress.
- There is growing evidence that Greene listens to politicians. His gateway opinion of March 1988, his approval of Pacific Telesis Group's international cable joint venture, his recent hearings on RBHC funding and investment in the equipment manufacturing industry and his approval of approximately 100 RBHC line-of-business waivers demonstrates that he keeps a close watch on developments on Capitol Hill.
- Greene recently said that he is not opposed to legislation relieving the RBHCs of certain restrictions, provided that the FCC takes over the role of effective regulator. In this respect, both the judge and Congress are in total harmony.

> The U.S. Congress should always be taken seriously, even when it appears to be acting with undue caution.
>
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With the recent nomination of three new commissioners to the FCC, there is renewed hope on Capitol Hill that the FCC will again begin to regulate the industry effectively, which Greene has advocated all along.

The Swift-Tauke bill was introduced as part of this new environment of cooperation. The bill, while opening up the equipment manufacturing and information services market to the RBHCs, insists that the FCC regulate effectively to promote existing competition and to protect ratepayers against unjustified increases in prices.

Congress is moving toward a legislative solution to the Modified Final Judgment problem. At the same time, Greene seems to be indicating that he wants to be relieved of the pressure of overseeing the decree. At 66, the judge is looking forward to either retiring or taking senior status, in which case he will substantially reduce his workload.

The legislative force to free the RBHCs has gained strength from Rep. John Dingell (D-Mich.), the powerful chairman of the House of Representatives Energy and Commerce Committee, who said "I suspect that Greene will continue in this business of regulating the telecommunications-information industry, but on a more constricted basis, limiting himself more specifically to the real interpretations of antitrust questions.

"In the longer term, Congress must assert itself as the body that must — and should — develop long-range policy for this industry. It is the Congress that established the FCC, and it is the FCC that should be regulating the industry and helping shape its future based on guidance from the Congress."

Dingell and his colleague, Rep. Ed Markey (D-Mass.), chairman of the House Telecommunications and Finance Subcommittee, say they believe that the public policy problem is much more complex than merely permitting the RBHCs to enter the information services and equipment markets.

They say that America needs much more. It needs information services that can be used as "a national educational tool," to make sure that all Americans are computer-literate and have equal access to a wide array of new, imaginative and innovative services. The convergence of computers and communications should be encouraged so that the U.S. can maintain its technological superiority along with its economic, social and political stability.

If the creation of an information age society is a high-priority agenda item, the Bush administration and the Congress, aided and abetted by industry interests, must work together to provide the incentives and the appropriate business freedoms so that the networks of the future can be built.

The U.S. Congress should always be taken seriously, even when it appears to be acting with undue caution. This time, however, a determination exists to develop a legislative package that will finally help shape public policy as we careen toward the information age. That legislation, in large part, will depend upon the cooperation that Congress receives from the industry and consumer groups. Interested parties must try to participate in the current congressional debate or, alternatively, risk the hazards of exclusion. ◼

Pearce is president of Information Age Economics, a telecommunications research firm in Washington, D.C.

TELETOONS

BY FRANK AND TROISE

Speak to us, Alice!! We have to know.. was it Information Anxiety or a broken chair leg?

LETTERS

Gaining control

Andres Llana, Jr.'s recent opinion column "Striving for the truth in circuit alarm reporting" (*NW*, May 22) caught my attention for two reasons.

First, it continues to amaze me that telecommunications managers are willing to continue to allow problems to occur and, therefore, affect their users before taking action. Basically, an alarm reporting system or private branch exchange alarming function is only slightly better than having the chief executive officer's secretary call to tell you that the boss just got disconnected for the third time that morning. If the telecommunications manager's counterpart on the data side were given the alternative between alarm monitoring and automated proactive testing, which would he choose?

Second, it appears that Mr. Llana is suggesting that the carriers — MCI Communications Corp. and US Sprint Communications Co. in partic-

(continued on page 52)

Network World *welcomes letters from its readers.*

Letters should be typed, double-spaced and sent to Editor, Network World, *375 Cochituate Road, Box 9171, Framingham, Mass. 01701.*

Letters may be edited for space and clarity.

WERE YOU ONE OF THOSE KIDS who went off to camp and never once wrote a letter to your parents the whole summer? Have you grown up to a be network manager who reads *Network World* every week but has never written a column for our Opinions pages? It's time to mend your ways!

Columns should be timely, opinionated, literate, thoughtful and accurate. Manuscripts should be letter-quality, double-spaced and between 600 and 900 words in length. Disk or modem submissions are preferred.

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BROKERAGES AND SECURITIES FIRMS

Trading places

By LYDIA BORGATTA

Communications networks are the lifeblood of securities trading environments. Fortunes can be lost when communications lines are down or response times lag.

For brokerages and banking institutions, it is critical that networks support submission of trades to clearinghouses in a timely manner, since few things are more serious than missing a clearinghouse closing. The results range from stiff fines to decreased audit ratings and, ultimately, decreased shareholder confidence.

In reality, most of the downtime that occurs in trading systems is caused by problems with the network. This is especially visible in environments that use fault-tolerant computing systems, such as those from Tandem Computers, Inc. and Stratus Computer, Inc. However, users in the trading environment usually attribute sluggish response time to a need for greater host CPU resources; often, these resources are added without first examining network capacity to see if it is the culprit.

Trading is one of the few environments — if not the only one — where an additional subsecond shaved off response time has the potential to translate into millions of dollars in profit. As a result, in a typical large brokerage company, easily 40% of the total MIS budget is spent on supporting the trading floor and its related activities. In short, trading networks are a technologist's dream come true.

Where they are

Trading operations are found in financial organizations that have met select requirements as determined by regulatory bodies such as the Securities and Exchange Commission. These include the capital investment required to support trading, which is considerable and differs for various financial instruments. For example, a foreign exchange trader might use one or two information feeds, while an equities trader needs four different market feeds. Other requirements include being licensed to do business in the U.S. and having a demonstrably auditable operation. Therefore, only the largest firms can afford to offer a variety of products.

Foreign exchange and other currency products were the first to benefit from information technology and, as a result, some of the most sophisticated applications are to be found in this sector. For example, foreign exchange traders were

(continued on page 34)

Borgatta is director of communications services with the New York financial branch of AGS Information Services, Inc., a firm that does systems integration and management consulting for Fortune 500 companies. The financial branch serves the 100 largest financial institutions in the U.S.

> Trading floor modernization is just the beginning of the technological revolution in the financial trading industry.

ILLUSTRATION ©1989 FRED LYNCH

(continued from page 33)

among the first to electronically enter their own trades via terminals, as opposed to writing up orders on tickets for back-office workers to enter manually. In fact, because of the short reaction time required, today's foreign exchange trading simply would not be possible without modern communications networks.

Communications nets that support trading are now in a state of transition — moving from concentrating primarily on trading floor activity to encompassing the larger, global trading community. This shift is the result of several trends.

Trading activity that occurs in a location other than on the trading floor is increasing. The stock market crash of Oct. 19, 1987, caused many organizations to review their investment strategies and move money to less volatile environments.

Although trading floors are still active and growing, there has been more emphasis on setting up salespeople in branch offices as companies have diversified or strengthened existing product lines, such as mutual funds. Thus the volume of trading has not been reduced but redistributed. Eventually, the focal point of trading communications and processing will no longer be the trading floor.

In addition, high-speed communications links, coupled with the construction and growth of new exchanges around the world, have diffused trading activity. Increased deregulation means more derivative financial products and, therefore, more participants in the marketplace spread over more locations.

As trading activity shifts from the trading floor to off-floor locations, the requirement for capital to support operations decreases. Together with less expensive communications and computing resources, the start-up costs for trading participants are easier to bear.

However, despite the Oct. 19 crash and the ensuing general retrenchment, the trading arena is still an environment where the most sophisticated technologies are seen as "white knights." For example, wireless local networks are seeing their first development and testing on trading floors such as the American Stock Exchange, Inc. The New York Mercantile Exchange is also evaluating wireless technology.

In spite of their overriding fear of downtime, trading floors are leaders in trying new unproven technologies. This is in part responsible for the industry's typically large, per-person expenditures for technology.

The costs to support a foreign exchange trader, for example, average between $30,000 and $55,000. And this range doesn't reflect the current trend toward digital news distribution. If this factor is included, an additional $15,000 would be added to network connections to reflect the high start-up costs. As shown in Figure 1 on page 51, several components are involved, notably a number of communications links between the trader's terminal and workstation and systems that supply information and process orders. And a typical large brokerage company might have between 200 and 300 trading positions on a floor. That adds up fast.

Degree of automation

With the introduction of powerful microprocessor-based workstations and high-speed network facilities, the functions traditionally supported by host-based back- and front-office systems are being reexamined. Those functions must be distributed to the workstation level without compromising the integrity of an organization's ledger.

Using workstations on the trading floor has a great deal of attraction for traders. With workstations, traders can access several pieces of information at once by looking at one windowed screen rather than at several different terminals. This eliminates the "wall of screens" syndrome, which is still prevalent in many trading organizations. In addition, desktop multitasking operating systems, such as Unix and OS/2, enable traders to perform more than one task at a time, such as viewing a news service while entering a trade.

The latest workstations allow integration of information from several feeds into a custom format designed for the individual trader. However, because of their tremendous investment in equipment, trading floors can't simply replace all their terminals and workstations. Many floors have only a handful of these new workstations, which typically have been installed to handle new products such as options trading, which requires a large number of calculations.

While workstations offer the ability to redistribute data processing functions from traditional data center environments, some trading organizations are concerned that implementing them will result in reduced data integrity and security. Making the workstations diskless and distributing only the functions that are innocuous, such as screen painting, can solve many of the data integrity problems. However, this results in a need for high throughput on the local network supporting the workstation, since the local net would act as the workstation backplane between the local net and the host.

Trading technology is still behind the times in the area of communications between trade-entry and trade-processing systems, that is, between the front and back offices. This is especially true for the exchanges. Trading tickets are written up by traders, and the transactions are rekeyed by data-entry workers.

Data from both front- and back-office systems is needed to create accurate "risk position statements," which are succinct views of an organization's total debits and credits at any particular point in time.

Currently, little automation exists between the front- and

(continued on page 51)

Trauma in the trading room

The issue appears simple. Trading room managers want their staffs to have the most sophisticated trading systems available. The problem, however, is that the traders themselves do not always want to use the available technology, for a number of reasons.

Geoff Gowey, vice-president and chief dealer of forward and Eurocurrency markets at Banque National de Paris in New York, says, "I'm an old hand at this market. The way I was taught to trade is based on economic data forecasts and my own gut feelings on where the market is going. People made money before these systems existed and could still make money if the systems didn't exist or couldn't operate."

According to Martin Siesta, assistant vice-president and securities trader for the Manufacturers & Traders Trust Co. in New York, "One of the major reasons that traders are resistant to these new systems is that they are accustomed to an environment that is audio-driven. The technique [for trading] that traders have developed over time can be sensed by the tone of people's voices."

"Traders initially are interested in what technology can do for them, but when the new systems are installed, they are reluctant to change their ways, particularly if they feel that the change required is a technical one," says Mike Mayhew, vice-president and manager of the personal computer products division of MMS International, a McGraw-Hill subsidiary located in New York.

The age factor

There is an age bias to this technical resistance. Younger traders, who may have less experience trading but greater experience with personal computers and terminals, have greater technical expertise and less technology paranoia than their more senior trading counterparts.

Mayhew says he believes that with time, the extent of the problem will be lessened. "As junior people become more senior, utilization of the technology will become a given part of the trading process," he says.

"Further, when the market returns to a level where it can support 'extra' staff, capable of performing analysis functions for those who are trading, the new systems will become a more vital part of the trading environment," he adds.

After the crash

The stock market crash of October 1987 had a significant effect upon the use of high-tech products in the trading markets. Where there had previously been room for investment in technology-driven trading products, there was suddenly no margin for anything that could be considered either frivolous or extravagant.

This newfound frugality applied not only to systems, but also to many of the junior staff members, traders and analysts who had found these tools so useful.

As involved parties — both the customers and the traders — develop greater confidence in the stability of the markets, these sophisticated tools and the analysts who use them best will return to the trading room or the back office.

Specifically, Mayhew says, "when the bull market returns, there will be sufficient resources to permit their dedication to the learning and utilization of the sophisticated technology presently available."

Siesta believes that for traders to fully accept the technology, several things must change. First, the network must be extremely reliable. In trading, there is no tolerance for system or circuit failures of any kind, because of the time-sensitive nature of the business.

Hardware and software must be sturdy enough to accommodate the most volatile of markets and traders.

Second, the information must arrive on a timely basis. Given the nature of trading and the people involved, it is essential that the information on the screens in front of the traders be 100% current.

In an environment where every second is critical, neither system or component failure nor information delay are acceptable.

Finally, the systems installed in a trading room must be very user-friendly. Typically, traders are not patient people. Traders who take the time to sit down and familiarize themselves with a system must find that system easy enough to work with so they do not feel that learning is a waste of time.

Gowey, who has been an active trader for a number of years, says that he uses the trading systems in front of him to provide "one more bit of information that goes into the equation. In terms of the man in the street who is averse to risk, trading systems provide the discipline necessary to direct the decision-making process from a variety of angles."

Too sophisticated?

Trading systems presently available to the market are highly sophisticated. So sophisticated, in fact, that Mayhew says most people use no more than 10% of the applications available to them.

A good example of this is the concept of the personal workstation. "A personal computer is much more anxiety-arousing for the trader than is a dumb terminal," he says. "For the most part, the non-computer literate trader does not look beyond the utilization of his personal computer as a dumb terminal device."

From a technical perspective, products and services are being developed to meet all sorts of needs. These needs, which are real to the product creator, may more aptly be dubbed "surreal" by the users the products are intended to serve.

The bottom line

In very basic terms, at the heart of the problem are the traders, who resist the changes being made in the trading room. The balance of the problem lies with the products, which are often either unfriendly or not sufficiently reliable. The ultimate solution appears to be a compromise between the traders and the systems manufacturers and designers.

There is no question that the new generation of trading systems, regardless of their level of sophistication, adds to the information base from which traders and trend analysts must work.

The issue then is to encourage the technology-resistant — and even the technologically impaired — to use the products that sit on their desk.

More broadly and most importantly, traders must recognize that computer-driven products are in trading rooms to stay.

At the same time, product developers must recognize that those systems designed with the tentative user in mind will be around for the long term.

— Martha Buyer

Buyer is an associate staff member in telecommunications with BDM Corp. in Boulder, Colo.

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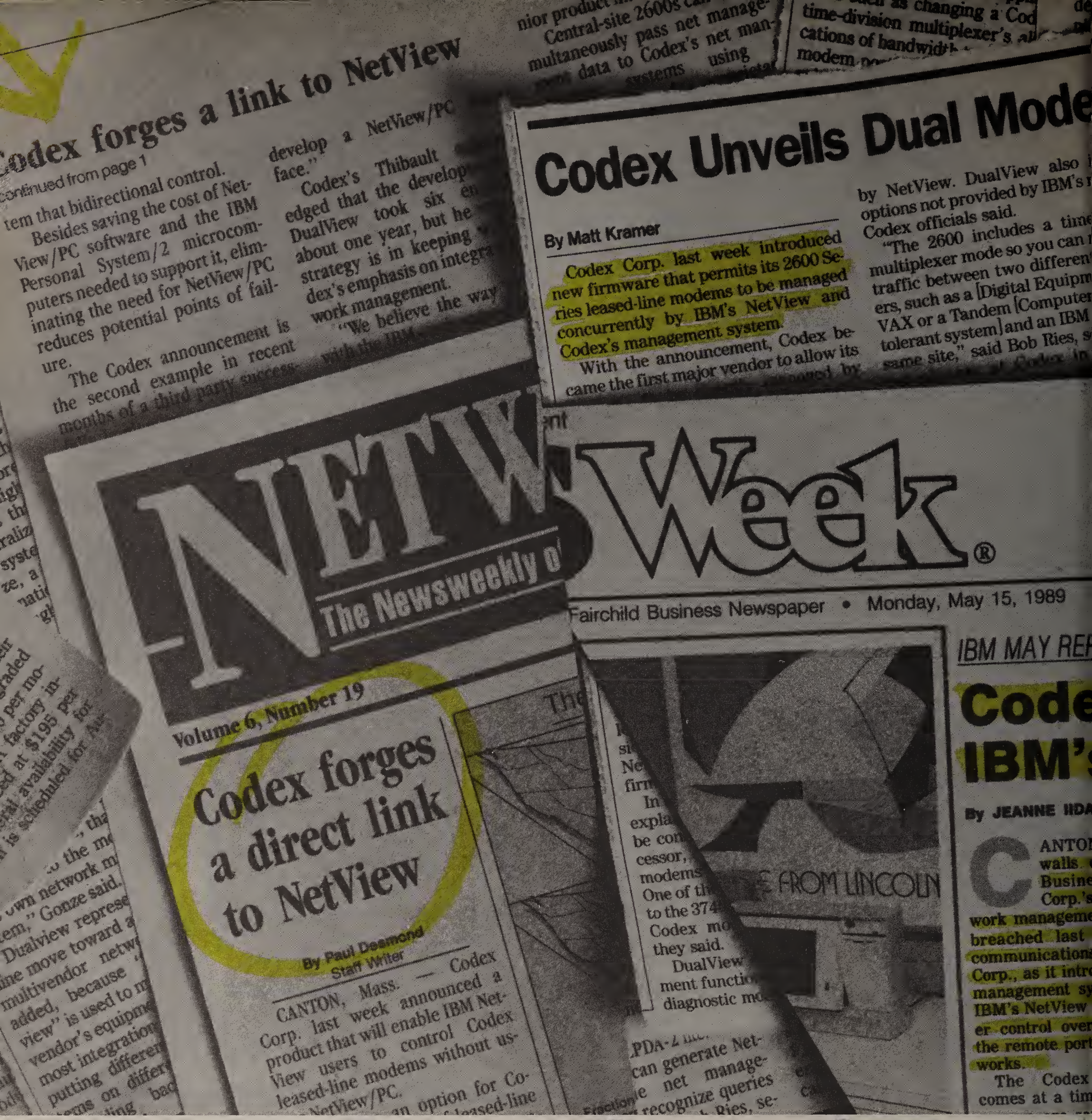

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Central-site 2600s ca
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systems using

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modem

Codex forges a link to NetView

Continued from page 1

tem that bidirectional control.

Besides saving the cost of NetView/PC software and the IBM Personal System/2 microcomputers needed to support it, eliminating the need for NetView/PC reduces potential points of failure.

The Codex announcement is the second example in recent months of a third party success-

develop a NetView/PC face."

Codex's Thibault edged that the develop DualView took six about one year, but he strategy is in keeping dex's emphasis on integra work management.

"We believe the way with the IBM

Codex Unveils Dual Mode

By Matt Kramer

Codex Corp. last week introduced new firmware that permits its 2600 Series leased-line modems to be managed concurrently by IBM's NetView and Codex's management system.

With the announcement, Codex became the first major vendor to allow its

by NetView. DualView also i options not provided by IBM's Codex officials said.

"The 2600 includes a time multiplexer mode so you can traffic between two differen ers, such as a [Digital Equipm VAX or a Tandem [Computer tolerant system] and an IBM same site," said Bob Ries, s

The Newsweekly o

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Fairchild Business Newspaper • Monday, May 15, 1989

Volume 6, Number 19

Codex forges a direct link to NetView

By Paul Desmond
Staff Writer

CANTON, Mass. — Codex Corp. last week announced a product that will enable IBM NetView users to control Codex leased-line modems without using NetView/PC.

an option for Co- leased-line

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By JEANNE IIDA

CANTO walls Busine Corp.'s work manageme breached last communications Corp., as it intro management sy IBM's NetView er control over the remote port works.

The Codex comes at a tim

Just a few of Dual

THE BEST MODEM FOR NETVIEW ISN'T FROM IBM.

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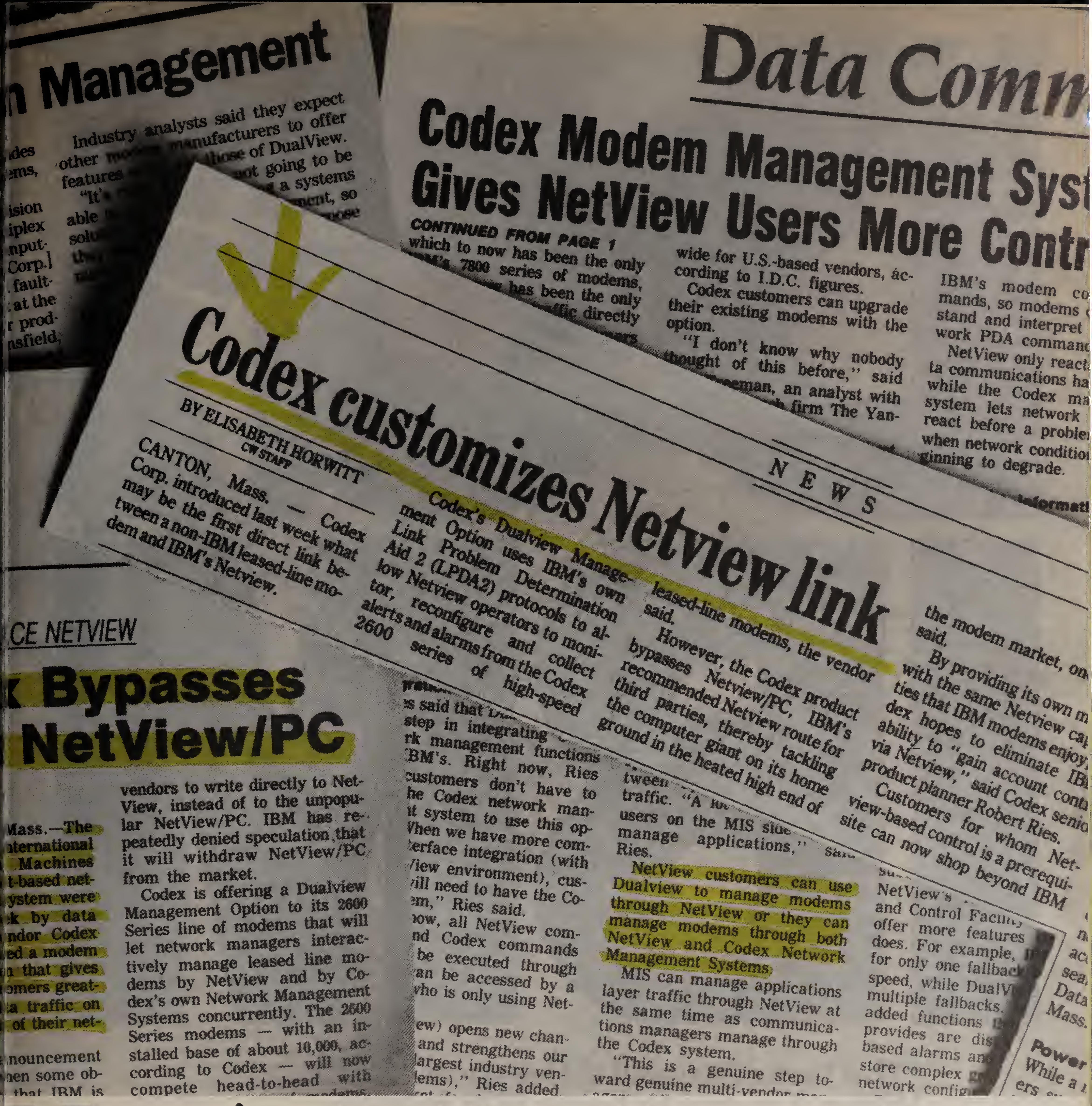

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Industry analysts said they expect other mo manufacturers to offer features those of DualView.

"It's not going to be a systems ment, so able solu the

Data Comm

Codex Modem Management Syst

Gives NetView Users More Contr

CONTINUED FROM PAGE 1

which to now has been the only M's 7800 series of modems, has been the only ffic directly ers

wide for U.S.-based vendors, according to I.D.C. figures.

Codex customers can upgrade their existing modems with the option.

"I don't know why nobody thought of this before," said eeman, an analyst with h firm The Yan-

IBM's modem co mands, so modems stand and interpret work PDA comman

NetView only react ta communications ha while the Codex ma system lets network react before a proble when network conditio ginning to degrade.

Informati

N E W S

Codex customizes Netview link

BY ELISABETH HORWITT
CW STAFF

CANTON, Mass. — Codex Corp. introduced last week what may be the first direct link between a non-IBM leased-line modem and IBM's Netview.

Codex's Dualview Management Option uses IBM's own Link Problem Determination Aid 2 (LPDA2) protocols to allow Netview operators to monitor, reconfigure and collect alerts and alarms from the Codex 2600 series of high-speed leased-line modems, the vendor said.

However, the Codex product bypasses Netview/PC, IBM's recommended Netview route for third parties, thereby tackling the computer giant on its home ground in the heated high end of the modem market, on said.

By providing its own m with the same Netview ca ties that IBM modems enjoy, Codex hopes to eliminate IB ability to "gain account cont via Netview," said Codex senio product planner Robert Ries.

Customers for whom Netview-based control is a prerequisite can now shop beyond IBM

CE NETVIEW

x Bypasses NetView/PC

Mass.—The nternational Machines t-based netystem were k by data ndor Codex ed a modem n that gives omers greata traffic on of their net-

nouncement hen some ob that IBM is

vendors to write directly to NetView, instead of to the unpopular NetView/PC. IBM has repeatedly denied speculation that it will withdraw NetView/PC from the market.

Codex is offering a Dualview Management Option to its 2600 Series line of modems that will let network managers interactively manage leased line modems by NetView and by Codex's own Network Management Systems concurrently. The 2600 Series modems — with an installed base of about 10,000, according to Codex — will now compete head-to-head with

s said that Du step in integrating rk management functions BM's. Right now, Ries customers don't have to he Codex network man t system to use this op When we have more com terface integration (with View environment), cusvill need to have the Com," Ries said.

ow, all NetView comnd Codex commands be executed through an be accessed by a who is only using Net-

ew) opens new chanand strengthens our largest industry venlems)," Ries added.

tween traffic. "A lo users on the MIS side manage applications," said Ries.

NetView customers can use Dualview to manage modems through NetView or they can manage modems through both NetView and Codex Network Management Systems.

MIS can manage applications layer traffic through NetView at the same time as communications managers manage through the Codex system.

"This is a genuine step toward genuine multi-vendor ma

NetView's and Control Facility offer more features does. For example, for only one fallback speed, while DualV multiple fallbacks. added functions provides are dis based alarms an store complex network config

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Power
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View's rave reviews.

AND EVERYTHING WORKS BEST WITH A CODEX 9800 NETWORK MANAGEMENT SYSTEM.

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BUYER'S GUIDE

ANTIVIRAL SOFTWARE

An ounce of prevention

By JOHN HUNTER

CONTINUED FROM PAGE 1

antiviral software by itself can't do the whole job; for users to protect their networks against viruses, they need to understand how viruses attack.

They're everywhere

Even seemingly safe software written by reputable authors and purchased through equally reputable outlets may contain a virus. Many viruses — some with potentially devastating effects — are introduced into software after it leaves the author's hands and before it enters the purchaser's hands. Certain viruses attack systems and application files, while others alter keyboard functions and cause errors or system crashes.

Viruses' favorite targets are the personal computer's operating system, system files, disk boot sectors, the COMMAND.COM file, the file allocation table (FAT), EXE.COM and CONFIG.SYS files, as well as the CMOS memory of Intel 80286- and 80386-based machines.

The CMOS contains the information the computer needs to access the hard drive and defines memory usage, floppy disk configuration and the type of video interface.

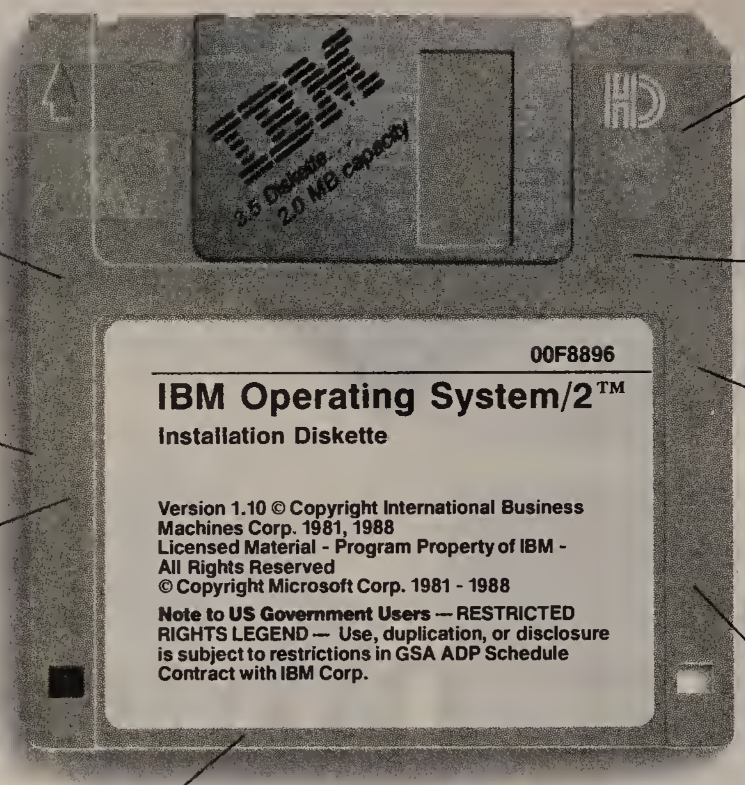
Boot-type viruses attach themselves to Sector 0 of floppy and hard disks and begin their destruction after the system is booted. This type of virus can infect hard disks and destroy the FAT, delete files and modify nonexecutable files. Some viruses can even perform low-level disk formatting, thereby wiping out the disk's partition table and boot tracks. The Pakistani Brain virus,

(continued on page 41)

Hunter is president of TMS Corp., a telecommunications consulting firm in Devon, Pa.

With computer viruses, antiviral remedies are worth any amount of cure.

Everything OS/2 can do for you…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(continued from page 39)

for example, attacks the boot sector.

Viruses enter the personal computer's random-access memory via hard or floppy disk drives and attach themselves to system files such as COMMAND.COM, CONFIG.SYS, AUTOEXE.BAT, executable files and overlays. Other hiding places for viruses are unused portions of systems files, partition-track waste areas and operating system hidden files used to hold the IBMBIO.COM and IBMSYS.COM. Many viruses are insidious and spread to almost any program with which they come in contact.

Running wild

Viruses do no damage until executed. Blocking a virus' entry into RAM or preventing it from doing damage should it slip into main memory are the principal functions of antiviral products.

Viruses run rampant because personal computers have no built-in security systems. In addition, the fact that users have total access to all system hardware and software makes it easy for viruses to spread.

Conversely, applications running on mainframes are restricted to the region assigned to them and can't infect other applications or the operating system. Furthermore, the operating systems and systems software running on mainframes vary with the installation; therefore, hackers have a more difficult time writing a virus that can penetrate them — let alone spread. Of course, a virus can get into the system if it's put there by employees intent on doing damage or if people are duped into running an infected program.

Another way for a virus to enter is through a trap door that's intentionally or unintentionally left in the operating system by its designers. Trap doors are entry points through which programmers can take direct control over some system functions.

Robert Morris Jr. allegedly used a trap door to insert the worm that directed Unix's SENDMAIL facility to flood the Advanced Research Projects Agency Network mail system with messages last fall. (A worm differs from a virus in that the latter replaces itself, while a worm does not. It just consumes computer resources with such voracity that system performance degrades or completely fails.)

Virus sources

Aside from viruses planted by employees, the main sources of viruses are programs listed on electronic public bulletin boards, programs borrowed from friends or public services such as libraries, evaluation programs furnished by vendors and stores, and programs purchased at retail stores or directly from the author. The latter two might come as a shock since it's generally assumed that software obtained from known sources hasn't been tampered with.

"A lot of people think because the [software's] box is shrink-wrapped that [the software] is safe, but they're wrong," states Ray Glath, president of RG Software Systems, Inc. in Willow Grove, Pa.

He points out that when software is returned to a store or manufacturer for some trumped-up reason, many go back into circulation without first being checked for tampering. "Some stores have shrink-wrap equipment and a hair dryer in the back room, so when software's returned, it goes right back on the shelf," Glath continues.

Russ Greenberg, president of Software Concepts Design, Inc. in New York, agrees. "Retailers don't want returns after they've been opened. Some shrink-wrap them and put them back on the shelf." The retail stores, however, deny this.

Sometimes the virus comes in the program as delivered directly from the vendor. "A good number of authors employ outside duplicators (companies that make duplicate copies from a master disk), and it's possible that the virus can be put in there," states Larry de Martin, president of Computer Integrity, Inc. in Boulder, Colo. "A couple of major manufacturers have had that problem but won't admit it," he continues.

Bulletin boards are another source of infected software. Here, program developers post their wares and invite people to download them for evaluation.

Unless the people running the bulletin board have thoroughly checked out all programs submitted for posting, subscribers are

(continued on page 42)

Virus?

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Antiviral products

Vendor	Product	Operating system	Terminate & stay resident product	Checksum	Boot sector	Partition table	File allocation table	Batch	Command, Execute and Configure system	Hidden files	Removes virus	Price
American Computer Security, Inc. **Nashville** **(615) 683-6741**	Compsec-II	DOS	No; hardware product	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	$450
ComNetco, Inc. **Bernardsville, N.J.** **(201) 781-7940**	ViruSafe	DOS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$150
Computer Integrity Corp. **Boulder, Colo.** **(303) 449-7377**	Vaccinate	DOS	No	Yes	Yes	Yes	No	No	Yes	Yes	No	$69.95
Director Technologies, Inc. **Evanston, Ill.** **(312) 491-2334**	Disk Defender	DOS	No; hardware product	Not applicable	Yes	Yes	Yes	Yes	Yes	No	Not applicable	$198 to $250 (includes detachable programming box)
FoundationWare, Inc. **Cleveland** **(216) 752-8181**	Certus	DOS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$189
Gilmore Systems, Inc. **Beverly Hills, Calif.** **(213) 276-5263**	Extended File Integrity Check	DOS	No	Yes	Yes	Yes	Not applicable	Yes	Yes	Yes	No	$15
Integrity Technologies, Inc. **Metuchen, N.J.** **(201) 906-1901**	Viral Alarm	DOS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	$5,000 (site license for 100 PCs); no single copies sold
InterPath Corp. **Santa Clara, Calif.** **(408) 988-3832**	C-4	DOS	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	$39.95
Panda Systems, Inc. **Wilmington, Del.** **(302) 764-4722**	Dr. Panda Utilities	DOS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Brain only	$79.95
Quaid Software, Ltd. **Toronto** **(416) 961-8243**	Antidote	DOS	No	Yes	Yes	No	No	Yes	Yes	Yes	No	$60 (U.S.)
Remarkable Products, Inc. **Northvale, N.J.** **(201) 784-0900**	Virus Buster	DOS	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	$49.95
RG Software, Inc. **Willow Grove, Pa.** **(215) 659-5300**	Disk Watcher	DOS	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	$99.95
RYBS Electronics, Inc. **Boulder, Colo.** **(303) 444-6073**	Gatekeeper	DOS	No	No	Yes	No	No	No	No	No	No	$79
Software Concepts Design, Inc. **New York** **(212) 869-6431**	Flu-Shot+	DOS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	$10
Software Directions, Inc. **Randolph, N.J.** **(201) 584-8466**	SoftSafe	DOS	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	$99
United Software Security, Inc. **Vienna, Va.** **(703) 556-0007**	Ongard	DOS	Yes	Optional	Yes	Yes	Yes	Yes	Yes	Yes	No	$295

DOS = PC-DOS and MS-DOS

This chart includes a representative selection of vendors in the antiviral products market. Many vendors offer other antiviral packages, and many not included offer a full range of competitive products.

TMS CORP., DEVON, PA.

(continued from page 41)

playing Russian roulette each time they invite a listed product into their personal computer. Reportedly, a hacked version of a well-known antiviral inoculation program was listed on a bulletin board; instead of protection, its users got trouble.

There are conflicting opinions regarding how well bulletin board operators police submitted software. Mark Sherman, president of ComNetco, Inc. in Bernardsville, N.J., feels that operators don't always check the applications sent to them, and therefore, it's caveat emptor.

However, RG Software's Glath and Harold Highland, editor of *Computers and Security Magazine* in Belmont, N.Y., feel otherwise. "I think [bulletin boards] have gotten a bad rap," Highland says. "Most operators do a good job."

Maybe so, but it would be wise to scrutinize the bulletin board operators as carefully as the software posted before hitting the personal computer's ENTER key.

A prime carrier of viruses is software borrowed from schools, libraries, computer clubs, friends and colleagues. Since the software is passed from person to person, a virus perpetrator can work with impunity.

"In my opinion, pass-along or borrowed software accounts for most viruses," states Pam Kane, president of Panda Systems, Inc. in Wilmington, Del. "A student brings home an infected disk from the school's library or computer lab, puts it on the home computer and infects the disk."

Highland shares Kane's views about inadvertent virus spreading. "Many times, employees bring in programs from clubs or something they've gotten from a magazine that's been infected. From there, it spreads to other machines."

With danger everywhere, what can be done to avoid contamination? There are many security methods, ranging from retinal scans and fingerprint checking to exercising common sense.

However, the simplest and most cost-effective approach is to block viruses before they can destroy anything. That's what antiviral software does.

Antiviruses

There are three general classifications of antiviral programs:

- Those that check all files to see if they've been tampered with before allowing them to be loaded.
- Those that monitor for illegal reads/deletes to system files during program execution and immediately block them.
- Those that check all files once they've been loaded into RAM to ensure they haven't been polluted by a RAM-resident virus.

The latter two are known as terminate-and-stay-resident (TSR) programs, which means that after they've been loaded and perform initial checking functions, they remain in RAM to perform other services such as monitoring for illegal write and delete activities.

Many products in this guide protect system files and operating system utilities by calculating checksums (sometimes called signatures) that employ an encrypted algorithm to produce a mathematical representation of each file or utility being protected.

Since the checksum looks at the number of bits and their positional relationships to one another, any addition, deletion or change, even to a single bit, will be detected.

Before a program is allowed to run, the checksum is calculated and compared with the last checksum to see if any unexplained changes have occurred.

Checksums provide a very reliable defense, but a virus author who has knowledge of the checksum algorithm can use it to produce false checksums and thereby fool the antiviral program.

While obtaining the algorithm is admittedly pretty tough, Chuck Gilmore, president of Gilmore Systems, Inc. in Beverly Hills, Calif., is taking no chances. "We produce two checksums using different algorithms for each and compare them before any program runs," he states.

Hardware roadblocks

All products in this guide are software-based, except Disk Defender and Comsec-II, which are add-on boards for IBM Personal Computers. With Disk Defender, the user reformats the hard disk into two distinct partitions, one write-protected and the other not write-protected.

Once installed, the partitioning makes the disk look like two separate ones; hardware settings block all updates to the read-only partition.

"Users put programs they want protected into the write-protect partition, and the hardware blocks any virus," states

Dennis Director, president of Director Technologies, Inc. in Evanston, Ill. "We do for hard disks what write-protect tabs do for floppies," he contends.

Comsec-II also performs hardware blocking but does not require the disk to be reformatted or partitioned. Instead, it restricts the areas on the disk where read-only and read/write operations can be performed.

Crying wolf

The software-based antiviral products block updates by intercepting all commands targeted at system files and displaying a message that a write/delete operation is being attempted. The drawback is that some virus protectors block legal as well as illegal operations until the operator approves the update.

As everyone knows, "cries of wolf" are ignored when heard too often, as are too frequent warnings. "When people repeatedly see virus warnings, after a while they ignore them and that defeats the purpose," Highland says.

To remedy that, several products allow users to build authorization tables of users/programs permitted to perform writes/deletes and therefore don't issue warning messages when legal operations are attempted. Such products include Disk Watcher, Dr. Panda Utilities, C-4, Ongard, Flu-Shot + and Certus.

Viral Alarm and SoftSafe, which are also TSRs and protect system files, issue no warnings at all. Sherman, whose ViruSafe warns on any unauthorized access attempt, says he feels that overrides could be a security problem. "We looked at [overrides], but we think it's a bad idea since it leaves the door open for hackers," he states.

Pounds of prevention

Even companies selling antiviruses admit that their products are only one line of defense and that more elaborate measures are necessary to guarantee security. Some protection measures being advocated are:

- Quarantining all shareware and bulletin board software until proven completely safe.
- Integrating antiviral software with hardware in order to make it tougher to defeat.
- Instituting elaborate logon schemes including complex multiple passwords and eye-retina identification.
- Introducing more sophisticated audit trails showing who did what while logged on.
- Restricting the use of the personal computer's A drive.
- Enforcing even tighter restrictions on the types of operations users can perform.

While such precautions might stop a virus or insider intent on doing damage, some are pretty impractical. Most large companies can't afford retinal scan identification and elaborate hardware solutions, which involve extending security to all devices on the network. While putting more restrictions on what users can do might stop internal sabotage, it will also cut deeply into productivity.

If it's conceded that someone intent on doing damage is going to be successful regardless of the roadblocks, then the next step is to minimize the destruction. Since the principal targets of viruses are hard-disk contents, making frequent backup copies restricts losses to only the current run and greatly simplifies reconstruction.

When the virus strikes, the hard disk can be cleaned and reformatted and RAM can be purged by turning off the personal computers for 30 seconds or so. Some experts recommend cleaning the disk twice in case the virus escapes the first cleaning. When reconstructing the operating environment, it's a good idea to use the original vendor-supplied disks with the write-protect tabs in place. That guards against infecting the original copies should the virus still be in RAM.

Many security experts caution users not to use an unverified program that's bootable from the A drive. This is because if it has an AUTO.EXEC file, it can take control of the system.

"That's true," states Glath, "but you need a license from IBM or Microsoft [Corp.] if the disk contains the COMMAND.COM, and IBMBIO and COM files. Without those [files], it won't boot."

If the virus diskette is bootable and has the AUTO.EXEC, the best defense is to have a program that recognizes the virus, says Bob Nagle, president of Nagle Associates, a software development house in New York. Unfortunately, given the number of viruses in circulation — some say there are hundreds — the probability of catching any one is not very high.

Therefore, if all boots from the A drive are banned except for those involving clean software and a top-flight antiviral product is installed, is the system relatively safe? Not necessarily, since the antiviral program can be fairly easily attacked. Antiviral programs are loaded to the AUTO.EXEC file, and since that file can be edited, a virus can look for a specific antiviral file name and delete it.

"That can be done, and the only way to stop it is to encrypt everything including the COM files. Right now, most [antiviral programs] encrypt only the signature file," Nagle says. The Dr. Panda Utilities takes a less complex approach. "We tell customers to substitute our file name with theirs, so the virus won't know what it's looking for," says Panda Systems' Kane.

Other vendors recognize the AUTO.EXEC Achilles' heel and declined to furnish the names of the viruses they defend against. Why tip off the enemy?

While today's antiviral programs seem to be holding their own on the battlefield, Highland sees dark days ahead. "We come across a lot of viruses, and lately we've seen variants directed against the antiviral products."

In a world of mutant viruses where it's every hacker for himself, it is imperative for users to take security measures to protect their systems and information. ◘

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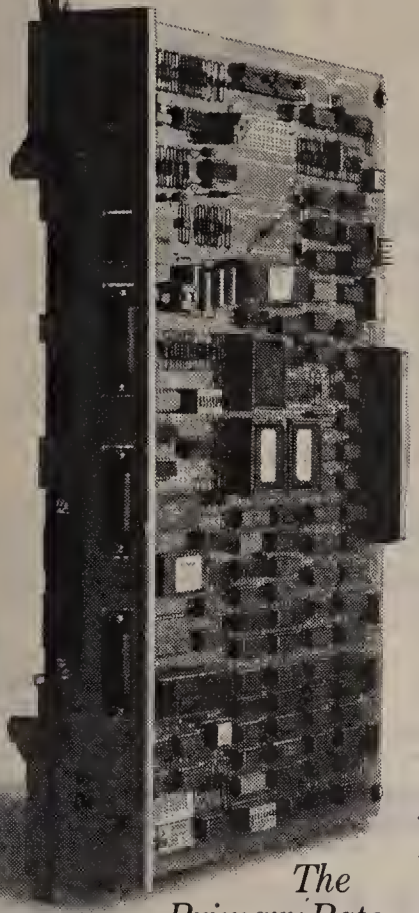

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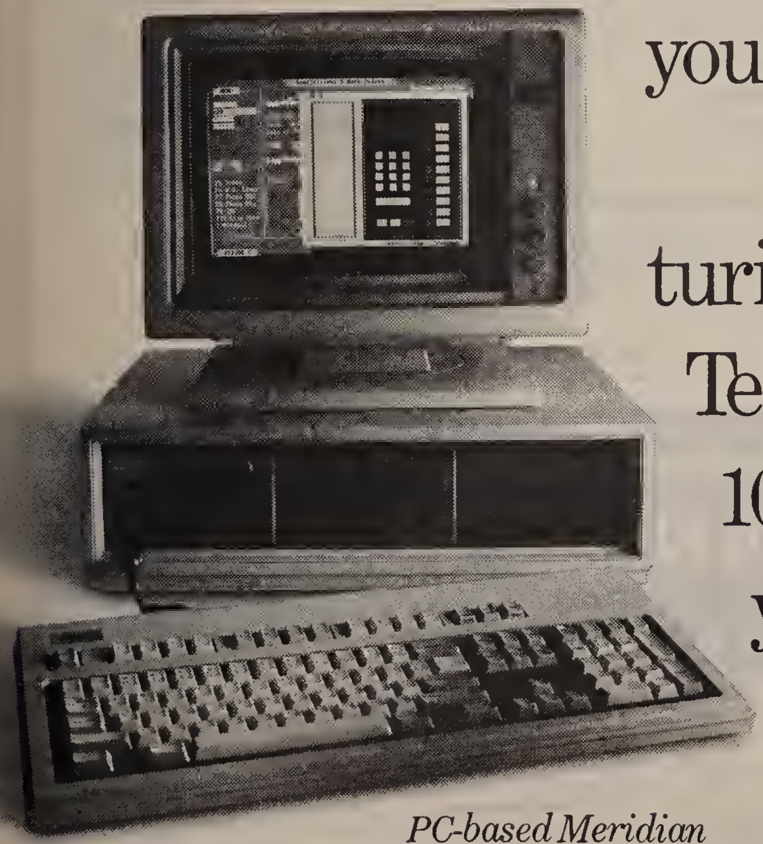

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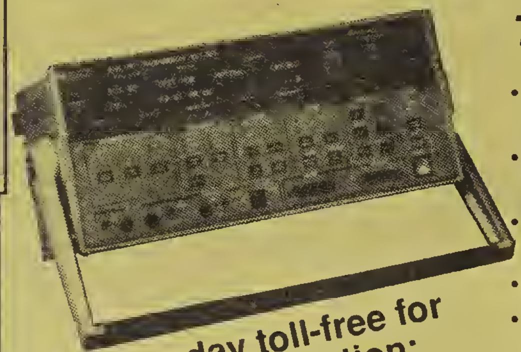

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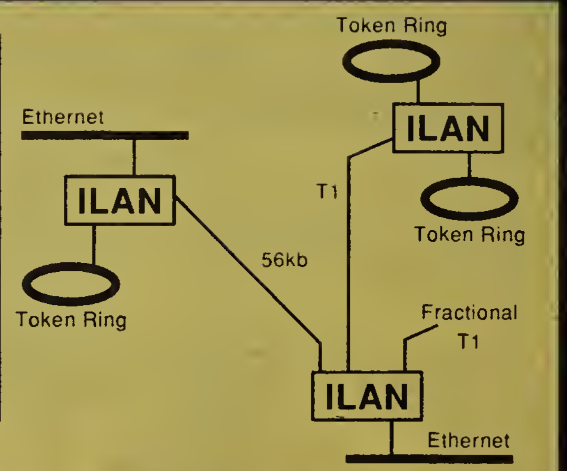

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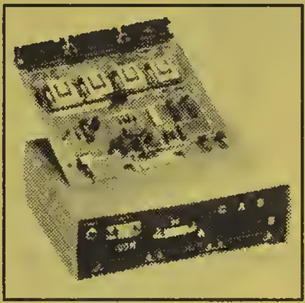

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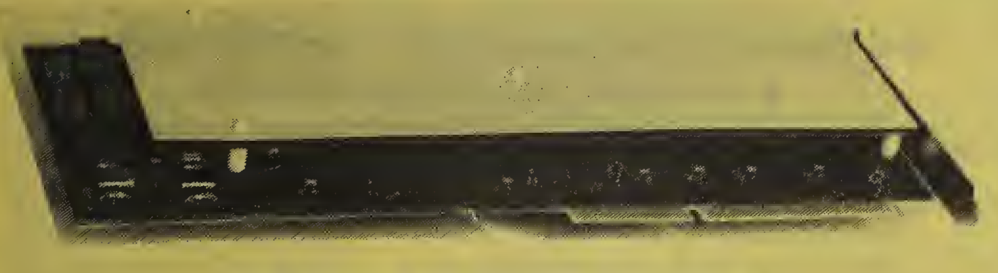

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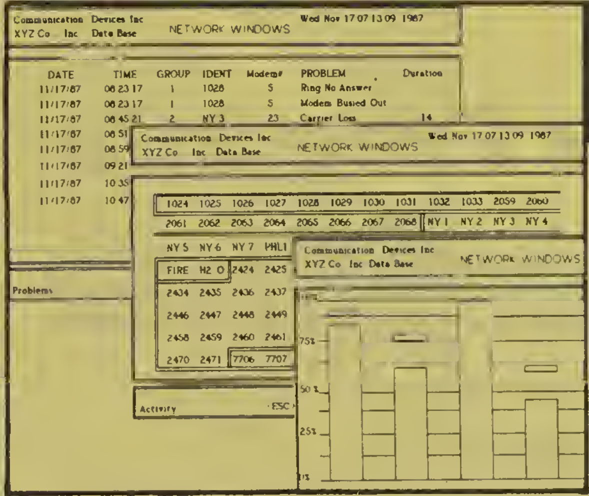

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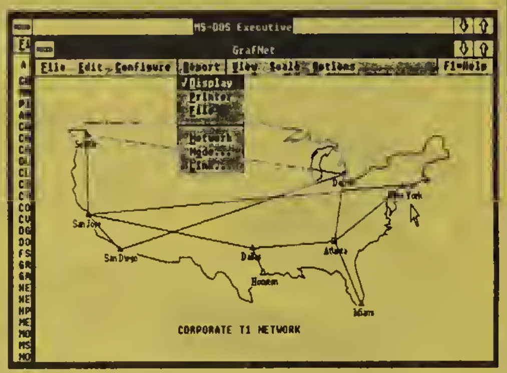

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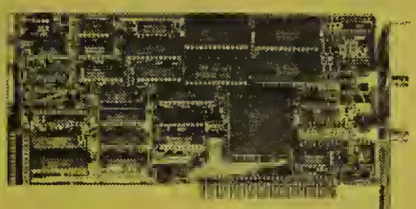

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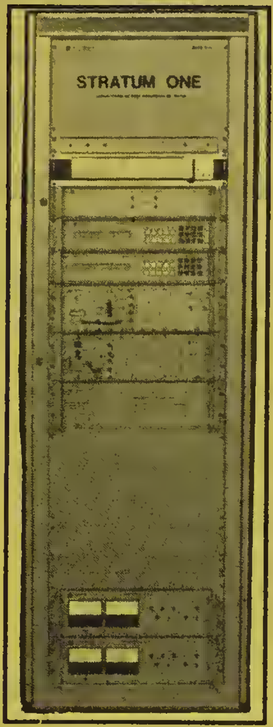

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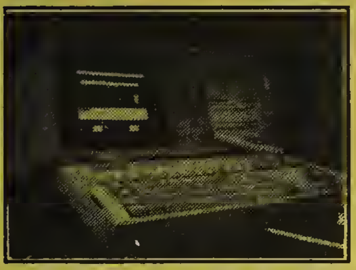

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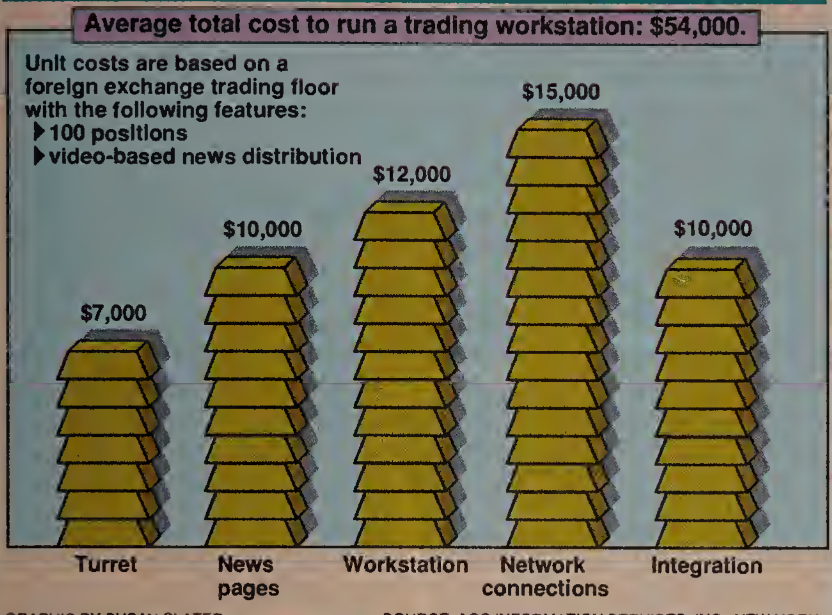
(continued from page 34)

back-office systems. There is no two-way flow to integrate current trading information with the back-office general ledger functions. Therefore, the generation of timely risk positions, in which a transaction is immediately posted, debited and credited, is not widely seen.

The lack of intersystem communications is primarily due to the disparate protocols and file formats used in front- and back-office systems. The back-office systems tend to be large IBM mainframe systems with large applications developed for general ledger, risk reporting and corporatewide adjustment.

Worth its weight in gold

Figure 1



GRAPHIC BY SUSAN SLATER SOURCE: AGS INFORMATION SERVICES, INC., NEW YORK

Front-office systems usually run trade capture applications, take in trade tickets and maintain a trader's blotter, the running total of daily activity. In most offices, a trader's blotter makes the assumption that the back office has processed those trade tickets correctly. However, errors are often introduced during rekeying.

Thus there is a critical need for communications links between the front and back offices, both to save time and increase accuracy. The ideal result is the generation of accurate risk positions for the trader, as the corporate system keeps track of the data needed to generate the risk positions.

Redefining roles

As technology evolves, front- and back-office functions will be redefined. What used to be totally separated will be less so because of powerful workstations. These workstations allow for applications with no restrictions on memory or response time, and applications can be designed independently of where the computing resource lies.

High-speed communications allows the computing resource to be located far away from the trading floor.

Currently, protocol conversion, as well as modification of data formats, is needed for data communications to occur between front and back offices. The difficulties are compounded by the fact that many of these systems are old and poorly documented.

The last wave of development for software in banking and brokerages occurred 10 years ago. These applications were written for old machines. Both brokerage firms and banks have major projects under way to redevelop large, old applications. This is not just a matter of rewriting code; it requires a complete redesign.

The problems of intersystem communications worsen with the introduction of high-powered workstations since these devices tend to have their own operating systems and protocols.

For example, the Sun Microsystems, Inc. workstation line, arguably the most popular trading workstation today, uses Transmission Control Protocol/Internet Protocol. In financial institutions, including exchanges, TCP/IP was relatively unused before Sun workstations were installed. Its introduction results in yet another protocol to be mastered and maintained, further complicating an already crowded group.

In most brokerage firms, disparate technologies are being consolidated wherever possible. Every large firm is developing a technical architecture that describes standard host processing and network environments, the products supported, and how new applications are to be developed, as well as data base design and file construction. This is all an attempt to keep environments open.

The choices of which standards to keep and which to discard are being facilitated by faster versions of current favorites, for example, the anticipated 16M bit/sec Token-Ring from IBM. In addition, the new wireless local net technology can use existing protocols to circumvent the problem of crowded conduits and ducts.

Vendors are also being pressured to offer comprehensive integrated network management tools to provide problem isolation and resolution, as well as inventory management. Where these remedies are not possible, systems integrators are being used to make the heterogeneous more homogeneous.

These endeavors require that workers have significant expertise in the applications and the protocols — a distinctly different kettle of fish from the expertise required to maintain the system once it is functioning. Therefore, systems integrators allow an organization to obtain third-party expertise when needed and, therefore, cost-effectively.

Technical trends

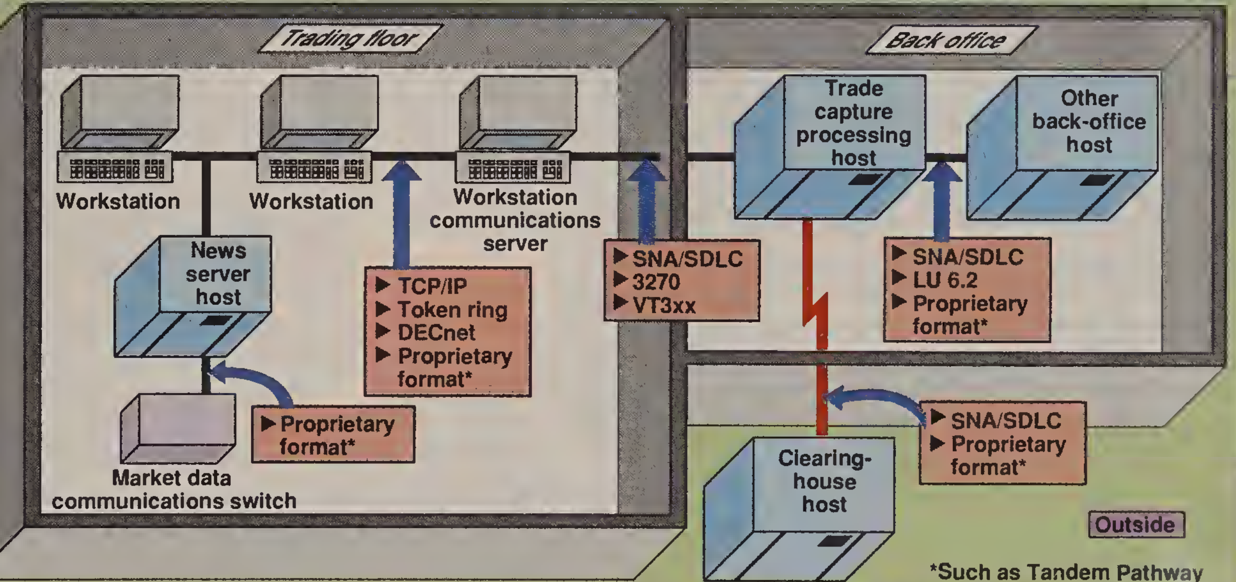
As more players enter the market, the profit margins become slimmer. Fewer new products are introduced, and the market nears saturation. Therefore, to compete effectively, reducing operating costs becomes vital. Unfortunately, trading has the highest operating costs of any financial business.

The business trend toward lowering operating costs is driving the following technical trends:

- **Extension of trading services support without sinking dollars into more infrastructure.** The goal is to build large distribution networks using international standards, such as X.25 and Integrated Services Digital Networks, wherever possible.
- **Conversion from video-based to digital-based news services.** The video-based distribution of financial information has gone hand in hand with what some consider a monopoly by the news providers.

Trading floor protocols and standards

Figure 2



*Such as Tandem Pathway

GRAPHIC BY SUSAN SLATER SOURCE: AGS INFORMATION SERVICES, INC., NEW YORK

The prevailing opinion in the trading industry is that the increasing availability of digital services will force providers to offer more competitive pricing, though the services — such as Telerate, Inc. and Reuters Information Service, Inc. — are resisting this trend.

Currently, they charge for their information service on a per-person basis. But digital information is much more easily distributed to any number of people; thus pricing practices will have to change.

However, the start-up costs to convert to digital distribution are in the hundreds of thousands of dollars, partly because of the need to convert cable. For the foreseeable future, only the big players will be implementing digital technology.

- **Twenty-four-hour trading.** This no longer means building a trading room in every location, but rather deploying high-speed, high-bandwidth T-1 communications and distributed processing computing systems to provide the illusion of a local resource.

> There is a critical need for communications links between the front and back offices, both to save time and increase accuracy.
>
> ▲▲▲

The most glamorous trend is toward electronic exchanges, notably the Chicago Mercantile Exchange's Global Exchange (GLOBEX) and the Chicago Board of Trade's Aurora. Rather than keep an exchange open later, requiring that floor members be present, the preference is to switch to an after-hours system. This allows off-premises traders to function after the regular trading floor has closed for the day. This move is primarily to capture or maintain eroding market share, for example, the lucrative Asia/Pacific trading market, which is just now beginning to develop.

The unsung hero

Trading networks are characterized by the ability to support high availability and active adds, moves and changes, as well as interface with a variety of computing environments. As noted in Figure 2 on page 51, the trading floor typically supports interfaces to many incompatible communications protocols. When connections to off-floor systems are included, the result is an extremely complex network.

However, positive changes are in evidence. For example, the recent request for proposal issued by the New York Stock Exchange for an all-fiber network as well as a review of its network management strategy is being done in preparation for a 1.5 billion-share trading day. Clearly, the network is a vital player in terms of capacity and performance.

In the future, further developments will result from more attention to the upper Open Systems Interconnection layers, especially unified data base mechanisms. There will be a lot more attention to File Transfer, Access and Management in order to facilitate interfile exchange. In general, traders will begin to take the network for granted. Network management, however, still has a long way to go to achieve effective fault and problem isolation.

The real issues that threaten to impede the progress of the trading industry are business-oriented or psychological. For example, traders are uncomfortable with the idea that trading will continue after they go home.

Also, psychologically, banking and brokerage firms prefer building an actual trading floor because that physical presence is part of what gets them customers. It is impossible to show physical presence with some terminals and wires. Another business-oriented issue is the fact that the market is getting smaller; because of operating costs, companies think twice before building physical floors.

Athough there are few, if any, technological impediments to building what is, in essence, an invisible floor, it will be several years before the industry migrates to that kind of system. ☑

Nets unhurt by slowdown

continued from page 1

hit by changes in the economy.

"Despite indications of an economic slowdown in our line of business, we haven't really seen anything yet that would cause us to cut back," said Glen Runyon, manager of corporate telecommunications at New Orleans-based heavy equipment manufacturer McDermott, Inc. "Our spending definitely follows the business cycle, but we've been on a general course to cut costs and increase productivity for the past few years."

Among the indicators of a cooling economy, the U.S. Commerce Department's index of leading indicators dropped 1.2% in May. This was the sharpest decline since November 1987, the month after the stock market crashed. In addition, factory orders in the same month skidded 2.5% while inventories grew 0.6%.

In late June, the Paris-based Organization for Economic Cooperation and Development, a research consortium of the world's leading industrial nations, predicted the U.S. economy would grow only at a 2% annual rate in the second half of this year, down from 3.75% in the first half.

And last week, the Economic Forum of the New York-based Conference Board, a research group supported by the world's largest corporations, said the "impressive [profit] gains of the 1980s are now behind us," as a slowing economy, strong dollar and increasing wages will combine to put the squeeze on company earnings.

Full steam ahead

Despite these trouble signs, most network managers say their spending plans haven't changed.

Michael Toto, vice-president of corporate telecommunications at Johnson & Higgins, a New York-based international insurance brokerage firm, said upper management recently approved a request for an increase in network staff to handle the growing internal demand for communications services.

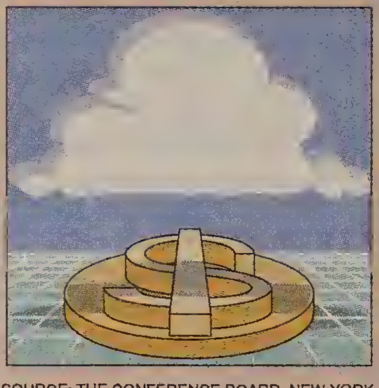
"We don't see upper management clamping down on allowing us to develop new products and services to support our internal users," Toto said.

Toto said the insurance industry generally feels the effects of an economic downturn later than its customers. But, he added, he would encourage management to invest in new technologies even during an economic slump to gain a technological advantage over competitors.

A cloudy profit picture

Factors expected to fuel a downturn in corporate profits:

- Slowing growth of the economy, which will restrict productivity gains and, in turn, raise production costs.
- Strengthening of the U.S. dollar, which will reduce international demand for U.S. goods.
- Accelerating wage increases, which will raise production costs.



SOURCE: THE CONFERENCE BOARD, NEW YORK
GRAPHIC BY SUSAN J. CHAMPENY

"I see some great opportunities even in an economic downturn," he said.

Robert Ravinski, a network communications and systems specialist for the Kendall Co. in Boston, said his company will continue to invest in leading-edge technology, even though money is tight and the economy is slowing down.

The hospital and health care manufacturing firm is working to link IBM Application System/400 minicomputers and IBM Personal Computers in IBM Token-Ring Networks, and it is ready to sign a deal with a major vendor for a redundant, wide-area data network, among other things.

"We are going full steam ahead," Ravinski said.

But things are different for some users. Dennis Barile, manager of telecommunications at Detroit-based Chrysler Corp., said that signs of a slowdown in the automotive industry have put a damper on new hiring.

"We've basically been told that we can't replace anyone lost through attrition," Barile said, adding that two employees have departed his department so far this year. Barile added, however, that no major projects have been scrapped or curtailed, although such cuts may be called for from the 1990 budget, which is slated to be done by the end of August.

Retail industry

In the retail industry, where sales of the 15 largest retailers climbed only a meek 4.7% in June, up from a slow month in the previous year, some communications managers are bracing for cutbacks. Deborah Phillipeck, a director of telecommunications at R.H. Macy & Co., Inc., said management asked her to cut her department's $1 million fall budget for the California region by $60,000.

"Usually, this late in the season, the budgets are frozen," she said. "Management probably doesn't anticipate increased sales growth for the coming season."

Phillipeck said management gives her a semiannual budget that is a fixed percentage of the company's gross sales receipts. As a result, Phillipeck's budget fluctuates depending on the volume of sales at Macy's stores nationwide.

Among some financial services companies, cutbacks have been steep. The Chicago Board Options Exchange is requesting that its telecommunications department not make any large capital expenditures for the coming year and has essentially frozen the department's budget, according to Chuck Garrison, vice-president of telecommunications at the exchange.

"We are looking at a very conservative budget. The exchange isn't backing down from its commitment to implement leading-edge technology, but it's reviewing every budget request with intense scrutiny," he said. ◘

Customs to build joint EDI net

continued from page 2

in a flood of paperwork and neither wants to add to the load.

Yet the absence of information sharing makes it easier for exporters to declare one set of goods in one country and arrive with a completely different set of goods in the U.S., Snell said. Companies can do this to avoid customs duties and to sidestep shipping restrictions.

By electronically receiving copies of export applications filed in Norway, he said the U.S. Customs Service will be able to compare them against statements of goods actually received in the U.S., helping the agency ferret out problems.

The Customs Service eventually plans to set up EDIFACT connections with customs authorities around the world, Snell said.

The agency got a boost earlier this month when the Customs Cooperation Council, which represents 104 national customs authorities, issued a declaration encouraging broader use of EDI and EDIFACT standards.

This was the strongest endorsement ever of EDI and EDIFACT by this influential international organization, according to James Shaever, an assistant commissioner at the U.S. agency.

To date, according to Snell, the U.S. Customs Service has managed to replace 76% of the paper import declarations it receives from shippers with EDI. Nearly all of the agency's EDI transmissions are currently performed via a proprietary protocol the agency established in 1983.

Eventually, Snell said, the agency wants to replace this protocol with EDIFACT to handle all of the import and export filings made with the U.S. government. ◘

Letters

continued from page 31

ular — are going to provide more and better access to alarms and "trouble indicators." Once again, it is being suggested that voice managers continue to react to problems, except in this case, relying on the supplier's system to let them know where there is circuit trouble. This sounds like the old "fox watching the henhouse" syndrome.

Network World readers should know by now that many automated net testing systems that can put the telecommunications manager in control of circuit quality are on the market.

Telecommunications managers should be asking the question, "How can I gain control of the quality of my circuits?" They should not be waiting for the carriers to provide more "after-the-fact" notification.

Michael Bitterman
Vice-president of sales
and marketing
Network Control Corp.
Danbury, Conn.

Feds blend EDI, EFT to pay bills

continued from page 1

of companies and about 20 banks use CTX.

The Defense Department is believed to be the first government agency to support CTX.

CTX is not the first standard addressing the need to include billing information — what is known as remittance data — with electronic payments, but it is the most flexible, according to Lt. Col. Jeffrey Noble.

Noble is chief of accounting and finance for the Defense Contractor Administration Services Region (DCASR) here, the first of nine DCASRs expected to use CTX. Collectively, the nine DCASRs pay more than $50 billion in annual bills.

DCASRs, which are part of the Defense Logistics Agency, administer payments for supplies and services rendered under defense contracts, Noble said. They use checks to pay some 61,000 invoices per month.

But late last month DCASR-Cleveland took steps to change that when it began paying General Electric Aircraft Engines Co. using CTX, Noble said. Last week, Noble met with representatives from the eight other DCASRs and the Defense Logistics Agency's Finance Center to start them on the CTX trail.

Because it complies with the ANSI X12 standard, CTX gives users more options for the format of the data sent with payments than did two earlier NACHA standards. Those standards are the Cash Concentration and Disbursement with Special Addendum and the Corporate Trade Payment, neither of which is widely used ("NACHA report supports merger of EFT and EDI," *NW*, April 17).

For each supplier it pays using CTX, DCASR-Cleveland will save the 25 cents it pays to mail a check, plus handling charges, Noble said. "Checks are costly. We never really did a computation of it, but [the savings] would be fairly significant," he said.

DCASR-Cleveland pays its bills through a Federal Reserve bank here. Payments made using CTX are sent to the Federal Reserve bank on a 2,400 bit/sec dedicated line, then via NACHA's electronic payment net to Pittsburgh National Bank, which represents GE Aircraft, a unit of General Electric Co.

Although GE Aircraft was the first to accept CTX payments from DCASR-Cleveland, Noble said talks are under way with other Defense Department suppliers that are anxious to accept electronic payments.

Besides saving money in processing checks for DCASR-Cleveland, CTX compatibility promises to save money for Pittsburgh National Bank and GE Aircraft by eliminating the manual process of reconciling paper checks and invoices. In addition, it reduces errors by eliminating redundant keypunching and speeds payments by taking the post office out of the payment loop.

Charles Harp, manager of electronic payment systems for GE's financial services operation, said GE saves between 75 cents and $1.50 through reduced bank charges for each payment it receives electronically.

In addition, the company achieves a 97% accuracy rating in accounts receivable as compared to a 70% rating with paper checks, Harp said. With paper documents, clerks have to compare checks to invoices to determine what the customer is paying, whereas payments made with CTX let GE's computers handle that task.

As companies that deal with the Defense Department learn of the potential savings, they will want to both pay and receive bills using the CTX format, said Susan Rapp, vice-president in charge of EDI/electronic funds transfer consulting at Pittsburgh National.

"The use of CTX by the Department of Defense will certainly show the rest of corporate America that this is not only a viable payment alternative, but that it has broad usage," Rapp said.

GE, for one, has already provided each of its divisions with the software required to support CTX, and the entire company is now capable of receiving CTX-compatible payments, Harp said. The company recently received a payment from its second customer to use CTX, the First Interstate Bank, Ltd. in Los Angeles, he said.

As more companies reach similar decisions regarding CTX, Harp said, banks will be forced to support the standard or risk losing business. ◘

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Subsidiary builds net utility

continued from page 1

network, dubbed LindeNet, by installing local networks and X.25 gateways at plants and regional offices. The local nets will replace a myriad of devices, including data switches, packet assemblers/disassemblers and protocol converters.

Industrial Gases, a subsidiary of Union Carbide, sells gases such as oxygen, nitrogen and argon produced by distilling air into its components, said Robert Richards, a computer communications consultant for the company.

Although an arm of Industrial Gases sells bottled gas on a retail basis, 70% of its $2 billion in revenue comes from its bulk gas business, the production of gas delivered by truck and pipeline. LindeNet supports the bulk gas business, and the retail side is supported by autonomous nets.

LindeNet is anchored by an IBM 3090 Model 180E mainframe, located here at the corporate data center, that supports engineering and financial applications.

The host is augmented by IBM System/38 minicomputers, which run accounting, benefits and credit systems, and a Hewlett-Packard Co. HP 3000 minicomputer that supports electronic mail, inventory and purchasing, said Bryce Morgan, manager of communications for the company. The Danbury site also serves as the net management center for LindeNet.

Three other national sites — engineering, research and development, and a specialty gas business — are tied to the main center here (see graphic, this page).

Downstream from Danbury, LindeNet supports five regional office sites that have HP 3000 minicomputers and Data General Corp. MV 2000, MV 2500 and MV 7800 minicomputers to handle distribution and truck dispatching applications. Regional offices also have as many as 200 personal computers, Morgan said.

The regional centers collectively manage 100 bulk gas production plants, which are typically outfitted with a handful of personal computers and a process control computer. LindeNet supports 33 of those plants today and will eventually support the rest, except for unmanned plants that require only dial-up access.

Life before LindeNet

Prior to development of LindeNet, the company operated parallel networks dedicated to the mainframe, System/38, HP 3000 and DG MV machines. The company also had a dedicated net to support office automation applications running on Wang Laboratories, Inc. minicomputers and a net that supported a remote job entry application on the mainframe.

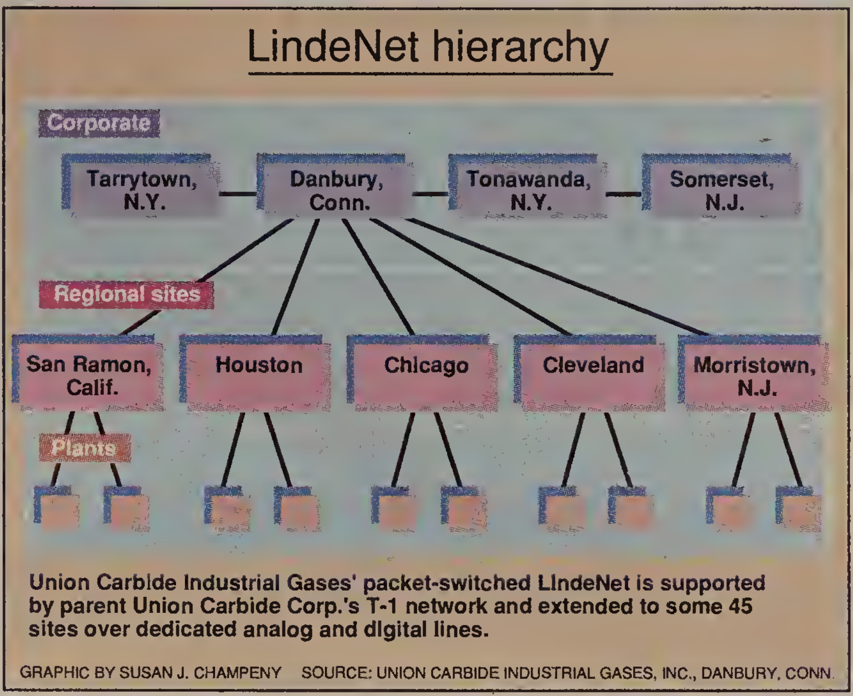
The six networks necessitated telecommunications lines traversing the same geographic area and required a plethora of machine-dependent terminals.

"Some people had multiple terminals or would go use a shared terminal," Morgan said. "Other people couldn't access systems they needed. They'd call somebody who had a terminal."

To remedy these problems, the company installed a packet-switched backbone two years ago that was based on PADs and packet switches from EDA Instruments, Inc. of Toronto.

"We wanted to separate the CPUs from the network," said John Barton, manager of Industrial Gases' systems group. "Today you can unplug all the hosts, and the net still runs."

LindeNet hierarchy



Union Carbide Industrial Gases' packet-switched LindeNet is supported by parent Union Carbide Corp.'s T-1 network and extended to some 45 sites over dedicated analog and digital lines.

GRAPHIC BY SUSAN J. CHAMPENEY SOURCE: UNION CARBIDE INDUSTRIAL GASES, INC., DANBURY, CONN

Packet switches at the national sites are linked in a linear topology to the corporate data center here by piggybacking on parent Union Carbide's T-1 network. The same T-1 net also supports 56K and 64K bit/sec links from Danbury to the regional sites.

Leased 14.4K and 19.2K bit/sec lines link the regional sites to the plants.

Employees now have, or are in the process of getting, microcomputers to replace their terminals. The microcomputers, typically IBM Personal System/2 Model 50s, run terminal-emulation software that enables them to access any minicomputer.

Depending on location, the Personal System/2s are attached to PADs or packet switches through a data switch, which saves CPU ports. The data switch also supports a protocol converter that provides mainframe access.

In addition to providing universal user access, LindeNet eliminated some hardware costs. For example, LindeNet saved the company $100,000 per year in canceled leases by making it possible to dump several IBM 5294 cluster controllers and 5250 terminals once used to access the System/38s. The personal computers now emulate 5250s.

Further hardware savings are in store. Industrial Gases plans to install 4M bit/sec token-ring local networks outfitted with X.25 gateways at its national and regional sites as well as some plant sites, Morgan said.

The company will turn a personal computer on each token ring into a network gateway by outfitting it with software and hardware from Eicon Technology Corp. of Montreal.

As implemented on LindeNet, the Eicon gateway will support as many as 254 sessions and emulate an asynchronous PAD, a Network Basic I/O System local network bridge, an IBM 3274 and a 5294 cluster controller. The gateway will also support DG and HP terminal emulation.

This eliminates the need for data switches, PADs and protocol converters, Morgan said, and provides a more reliable, less hardware-dependent environment. ◪

DEC expands software in NAS

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Computing Group, a Boston-based consulting firm, positioned DEC's expanding NAS strategy against IBM's Systems Application Architecture (SAA).

But NAS has several advantages over SAA, Davis said. NAS supports a variety of desktop systems, including MS-DOS personal computers and Macintoshes, while IBM's SAA OfficeVision only supports IBM systems.

"Another advantage is the full integration of Unix in DEC's strategy," she said.

RISC assessment

DEC also unveiled three RISC-based Ultrix servers, the DECsystem 5400 Departmental Server, the DECsystem 5810 and 5820 Data Center Servers.

The DECsystem 5400 has 64M bytes of random-access memory and supports from 64 to 128 users. Pricing starts at $49,900; it will ship in 60 days.

The DECsystem 5810 and 5820 servers are one- and two-processor machines, respectively. Based on a 25-MHz R300 chip, the DECsystem 5810 and 5820 each support as many as 300 users and boast between 19 and 36 VAX units of performance. Pricing for the DECsystem 5810 ranges from $99,000 to $121,500; the DECsystem 5820 costs $174,000 to $196,000. Both will ship in 90 days. ◪

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